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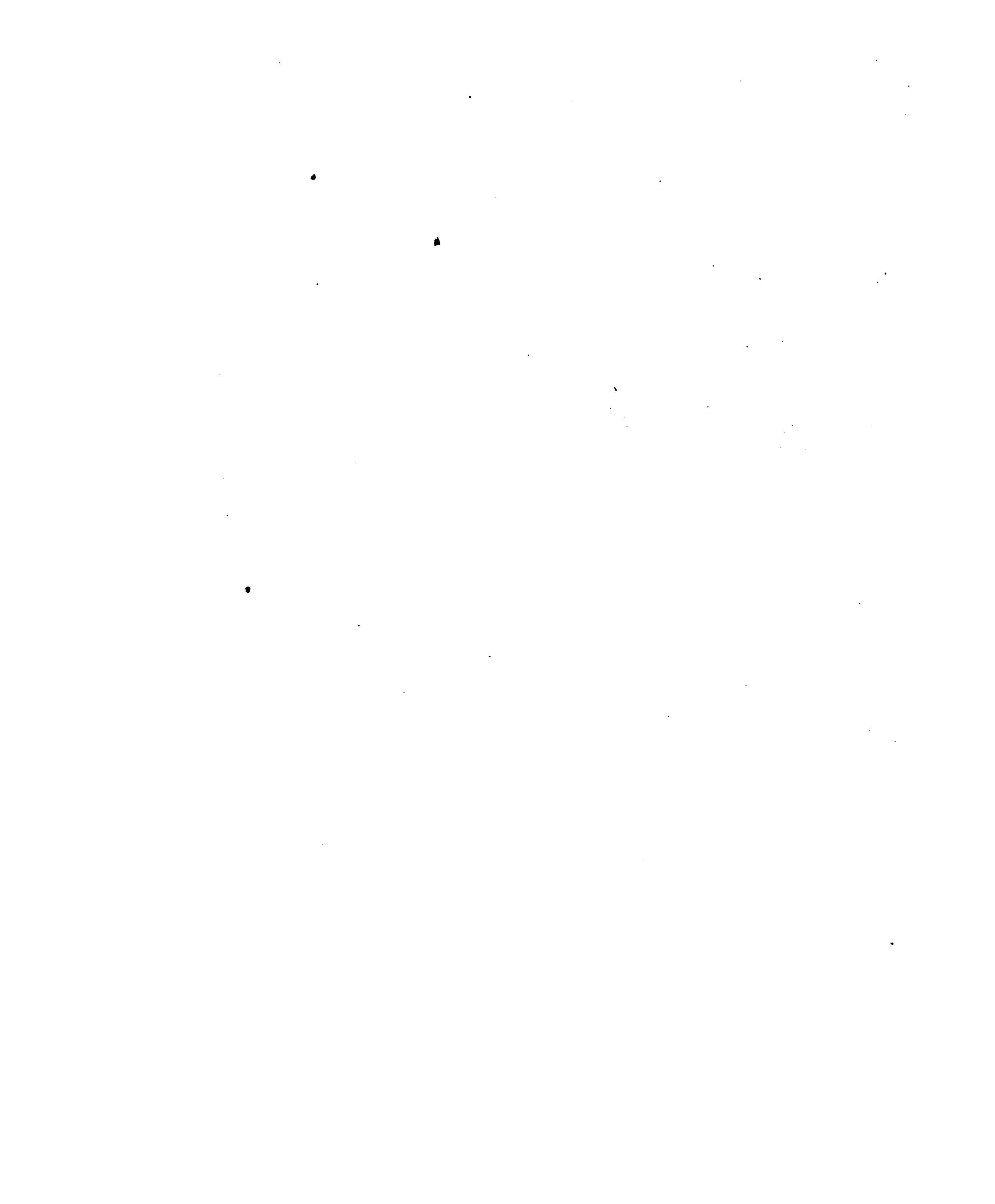
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DETAILS OF BUILDING CONSTRUCTION

BY
CLARENCE A. MARTIN
ASSISTANT PROFESSOR OF ARCHITECTURE
CORNELL UNIVERSITY



BOSTON, MASS.
BATES & GUILD COMPANY
1899

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PREFACE.

THE author would have preferred to present this book to the public without a prefatory note, had not some explanations seemed necessary in order to prevent misunderstanding. The work is not the result of a deliberate attempt at book-making, undertaken with "malice prepense," but is the outcome of the efforts made by a teacher of architectural construction to present a part of his subject to his students. The drawings, consisting originally of rough sketches on large sheets of wrapping-paper, were at first used for temporary illustration only; but the results proved so satisfactory that it seemed best to study the work more carefully and to put it into more permanent form for class-room use.

This was undertaken some three years ago, still without thought of publication; and it was only after the first sixteen plates in blue-print form had been used for some time that their favorable reception by students, and by others who learned of them through students, suggested that they might prove useful to workers outside the college class-room. The revision and completion of the work were accordingly undertaken. Two or three of the original plates have been redrawn; but to redraw them all for the sake of uniformity and possible minor improvements would have involved an amount of labor not justified by the advantage gained, and would have necessitated a longer delay in publication than seemed advisable. In method of presentation, therefore, the work still shows to a considerable extent the various stages of its progress through a period of full three years. In other respects the attempt has been made, by means of careful revision in the light of the best criticism available, supplemented by continuous study and independent investigation, to present the best methods employed or recommended in present-day practice.

In scope the work limits itself to presenting only such details, principally in wood, as are in common use in domestic architecture and in smaller public buildings. The subject of framing has been entirely omitted, partly because it has been amply treated elsewhere, partly because it does not lend itself readily to the method of treatment here chosen. In the matter of design the author wishes to put in a disclaimer. Nothing is further from his intention than an attempt to dictate in a question of design, but it has been necessary to use design in order to show construction. Therefore, while every effort has been made to show only the good in design, it should be borne in mind that the book is a treatise not on that subject but on construction.

In the method of presentation, the inconsistency arising from the fact that the work was so long in a process of becoming, and that its final evolution into book form remained so long unforeseen, has already been mentioned. The exact character of this inconsistency may be seen by comparing the plates treating of windows with those treating of doors. In treating of windows one plate is devoted to a certain type of window, with the corresponding details, then another plate takes up a different type, and so on. When, however, the subject of doors is taken up, one plate is devoted to types of doors, another to details of frames, another to details of panels, etc. For this there was no remedy except the radical one of redrawing the plates; and the case did not seem to warrant recourse to measures so heroic, since it is, after all, an open question as to which method is the better.

The device of lettering the notes on the plates, instead of presenting them separately in the form of text, was of necessity a part of the original idea, which contemplated only separate plates; and when the work of revision was undertaken, it seemed wise to retain the scheme. It is hoped that the obvious advantage of having the notes on the plates in close juxtaposition to the drawings to which they refer will more than compensate for the disadvantages of an enforced brevity so severe as to be almost incompatible with good English, and of an appearance of dogmatism which the writer would have preferred, if possible, to avoid. That the notes must be read in conjunction with the study of the drawings, if the latter are to be fully comprehended, would seem to be a fact so obvious as to require no emphasis, had not some

of the criticisms received during the progress of the work revealed the fact that the not been neglected, despite the device used for securing their perusal.

In the matter of nomenclature care has been taken to use only such terms as are tioned by the authority of the best writers on architecture and building, and to use them accurately, not in the hope of bringing order out of the chaos of architectural terminolog only in the hope of escaping the accusation of having worse confounded the present de ble confusion.

The drawings have been carefully prepared after a long, practical experience and wi aid of one of the best libraries in this country, supplemented by a large collection of w drawings from the offices of leading architects. No pains have been spared to free them far as possible from the taints of local practice; and while not all that is shown is unre recommended, great care has been taken not to include anything that has not the autho good practice, and that may not fairly be called good construction when the element c is considered. Some cheap methods of construction have been shown and recommen good of their kind. Such, for instance, are the wood sills shown on Plate VI., which already been subjected to adverse criticism, but which it seemed best, after mature con tition, to retain. The wood sill in other than frame buildings has the same excuse for as has the shingle roof—it is cheap. It can of course be justified only on the score pense; but it has the sanction of good practice in sections of the country where cut si not easily and cheaply obtainable, it is painted and treated frankly as wood, and has sto test of time.

It has several times been suggested that the dimensions of parts be figured on the v details throughout the work, but to the author this has seemed entirely too dogmatic cedure. As the sturdy Pennsylvania farmer builds his house with 3 x 5-inch studs,— does not build of stone,— and does not think of extravagance, while the toiling dw the cyclone regions of the West builds with 2 x 4-inch studs and wonders if he cannot space them 24 inches on centers, so the 2 $\frac{1}{2}$ or 3-inch window-sill that is accepted as a of course in one section would strike terror to the heart of the builder in the thriftier where the 2-inch sill is an extravagance. In order to make the drawings, however, it w essary to show material of definite size and thickness, and the dimensions chosen for thous parts have been made to represent as nearly as possible the average of good practic everything has been most carefully drawn to scale, the sizes used can be ascertained to a by simply measuring them on the drawings. The type window, Plate IV., has been fully figured, but beyond this it was felt that figured dimensions would seem to be an a at finality that would tend to restrict the liberty of choice and the exercise of individua ment on the part of designer and constructor, without which there can be no true pr If the work is to be used simply as a copy-book it must inevitably fail of its purpose, in the intent of the author has been much broader.

The few pages of advertising have been added to the work not so much for the sake revenue derived therefrom as with the hope that they may contribute to the actual v the subject-matter by calling attention to special devices or details that could not well cluded within the body of the book.

In order to avoid accusations of plagiarism, it may be well to mention that Mr. Kidder, in his work on Building Construction and Superintendence, has done the auth honor of using a part of the drawings relating to window details.

In conclusion the author wishes to express his sense of obligation toward all tho have so generously assisted him both directly and indirectly with their criticisms and s tions during the progress of the work, and his hope that the book will be found suffi helpful to elicit further criticism looking towards the improvement of future works character, whether by the author or by others. C. A.

ITHACA, N. Y., August, 1899.

LIST OF PLATES.

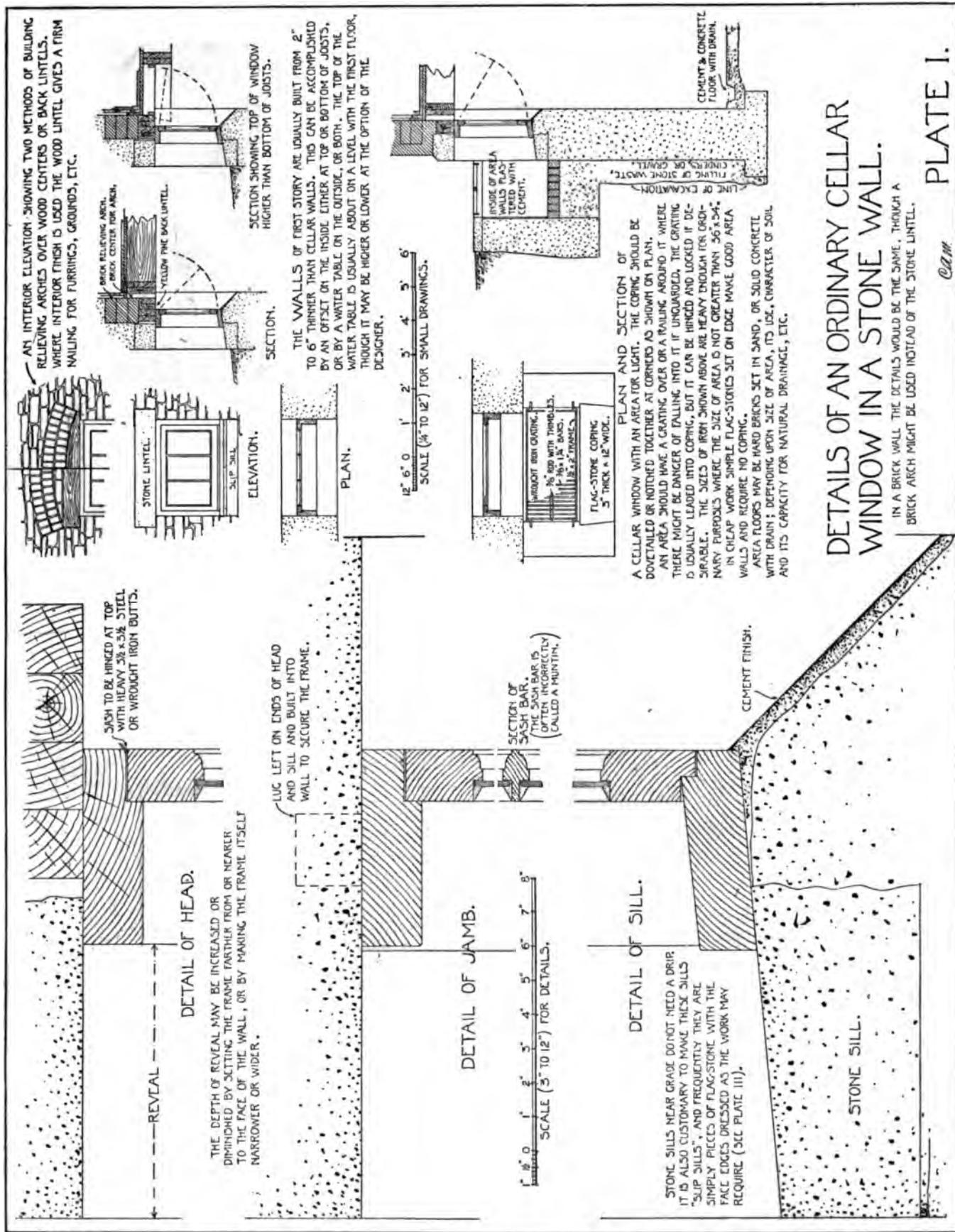
- I.—DETAILS OF AN ORDINARY CELLAR WINDOW IN A STONE WALL.
- II.—DETAILS OF CELLAR WINDOW WITH SCREEN AND IRON GRILLE.
- III.—DETAILS OF CELLAR WINDOWS AND BASE COURSES FOR FRAME COTTAGES.
- IV.—A TYPICAL DOUBLE-HUNG WINDOW.
- V.—DETAILS OF DOUBLE-HUNG WINDOWS WITH INSIDE SHUTTERS.
- VI.—WINDOWS WITH OUTSIDE SHUTTERS.
- VII.—DETAILS OF COUNTER-BALANCED WINDOWS WITH MULLIONS AND TRANSOMS.
- VIII.—DETAILS OF WINDOWS IN FRAME WALLS.
- IX.—DETAILS OF DOUBLE HUNG WINDOWS IN FRAME WALLS.
- X.—MISCELLANEOUS DETAILS FOR DOUBLE HUNG WINDOWS.
- XI.—DETAILS OF BAY WINDOWS WITH COUNTER-BALANCED SASHES.
- XII.—DETAILS OF CASEMENT WINDOWS OPENING OUTWARD.
- XIII.—DETAILS OF CASEMENT WINDOWS OPENING IN.
- XIV.—DETAILS OF A CASEMENT WINDOW WITH MULLIONS AND TRANSOMS AND WITH SASHES OPENING OUTWARD.
- XV.—DETAILS OF A CASEMENT BAY WINDOW.
- XVI.—DETAILS OF PIVOTED CASEMENTS AND EYEBROW DORMERS.
- XVII.—STORM-RESISTING WINDOWS.
- XVIII.—TYPES OF DOORS WITH GENERAL DIMENSIONS.
- XIX.—EXAMPLES OF DOORS IN VARIOUS STYLES.
- XX.—DETAILS OF OUTSIDE DOOR FRAMES, STONE SILL, AND TRANSOMS.
- XXI.—DETAILS OF INTERIOR DOOR FRAMES AND WOODEN SILLS.
- XXII.—DETAILS OF DOORS.
- XXIII.—DETAILS OF SLIDING DOORS.
- XXIV.—DETAILS OF GUTTERS, FOR WOOD, STONE, AND TERRA-COTTA CORNICES.
- XXV.—DETAILS OF BOX CORNICES.
- XXVI.—DETAILS OF OPEN TIMBER CORNICES.
- XXVII.—DETAILS OF OPEN TIMBER CORNICES.
- XXVIII.—MISCELLANEOUS EXTERIOR DETAILS.
- XXIX.—WAINSCOTING AND ARCHITRAVES.
- XXX.—GENERAL INTERIOR FINISH.
- XXXI.—STAIR DETAILS.
- XXXII.—KITCHEN AND PANTRY DRESSERS.
- XXXIII.—FIREPLACE DETAILS.

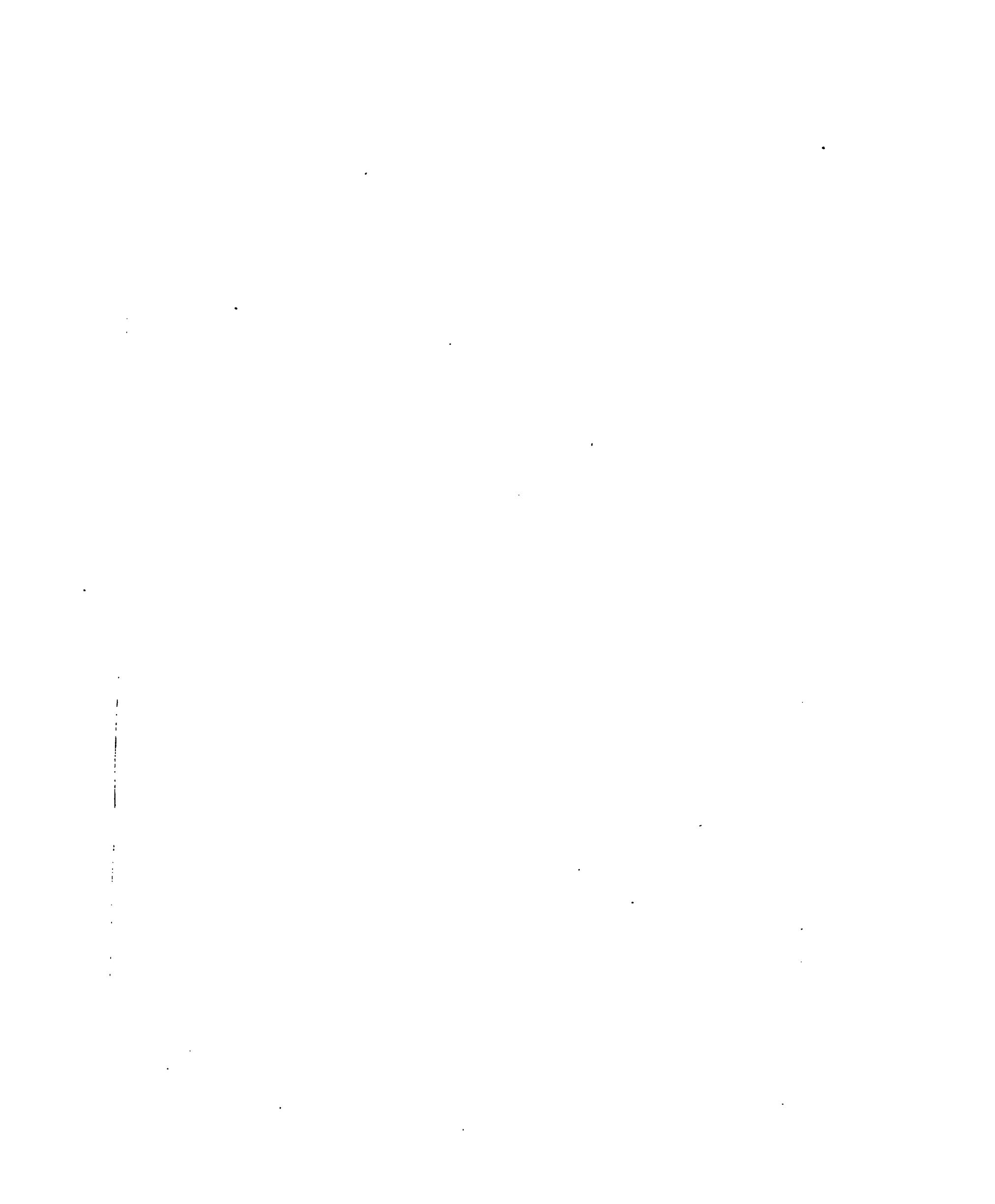
NOTE.

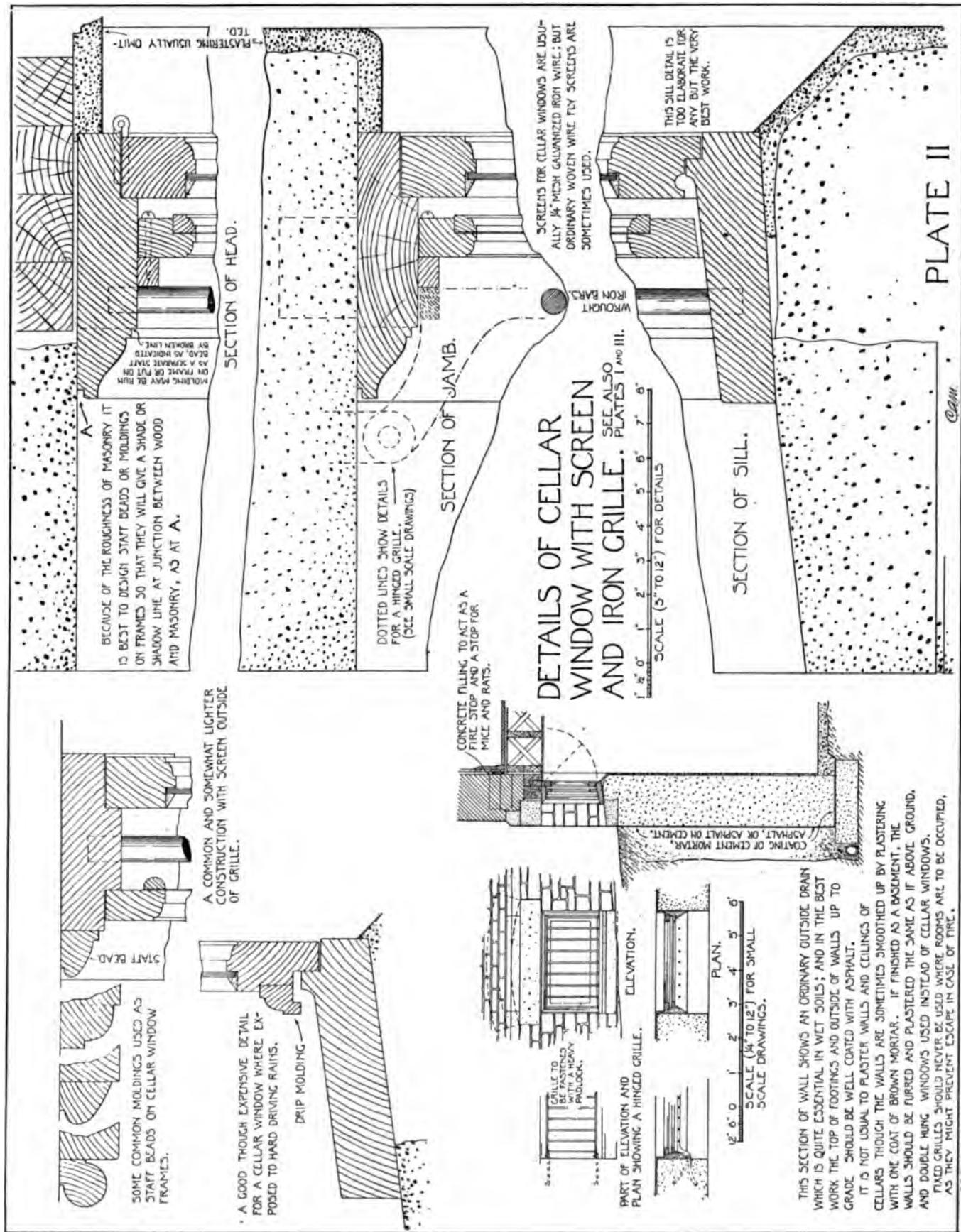
THE THICKNESS OF LUMBER FOR FINISHED WORK

The boards and planks used for sheathing, flooring, and the finer work about building measure in the rough 1 in., $1\frac{1}{4}$ in., $1\frac{1}{2}$ in., 2 ins., $2\frac{1}{2}$ ins., and 3 ins. in thickness. White pine and other lumber produced in the North is usually sawed to full thickness so that planing on both sides can ordinarily be done with a reduction of only $\frac{1}{8}$ in. in thickness; but lumber from the Southern markets, such as yellow pine, etc., is sawed so that it is necessary to count upon a reduction of $\frac{1}{4}$ in. in thickness for all lumber having a nominal thickness of 2 ins. or more. This gives the ordinary stock dimensions for the thickness of finished lumber as follows: $\frac{7}{8}$ in., $1\frac{1}{8}$ in., $1\frac{3}{8}$ in., $1\frac{3}{4}$ in. or $1\frac{7}{8}$ in., $2\frac{1}{4}$ ins. or $2\frac{3}{8}$ in. and $2\frac{3}{4}$ ins. or $2\frac{7}{8}$ ins.

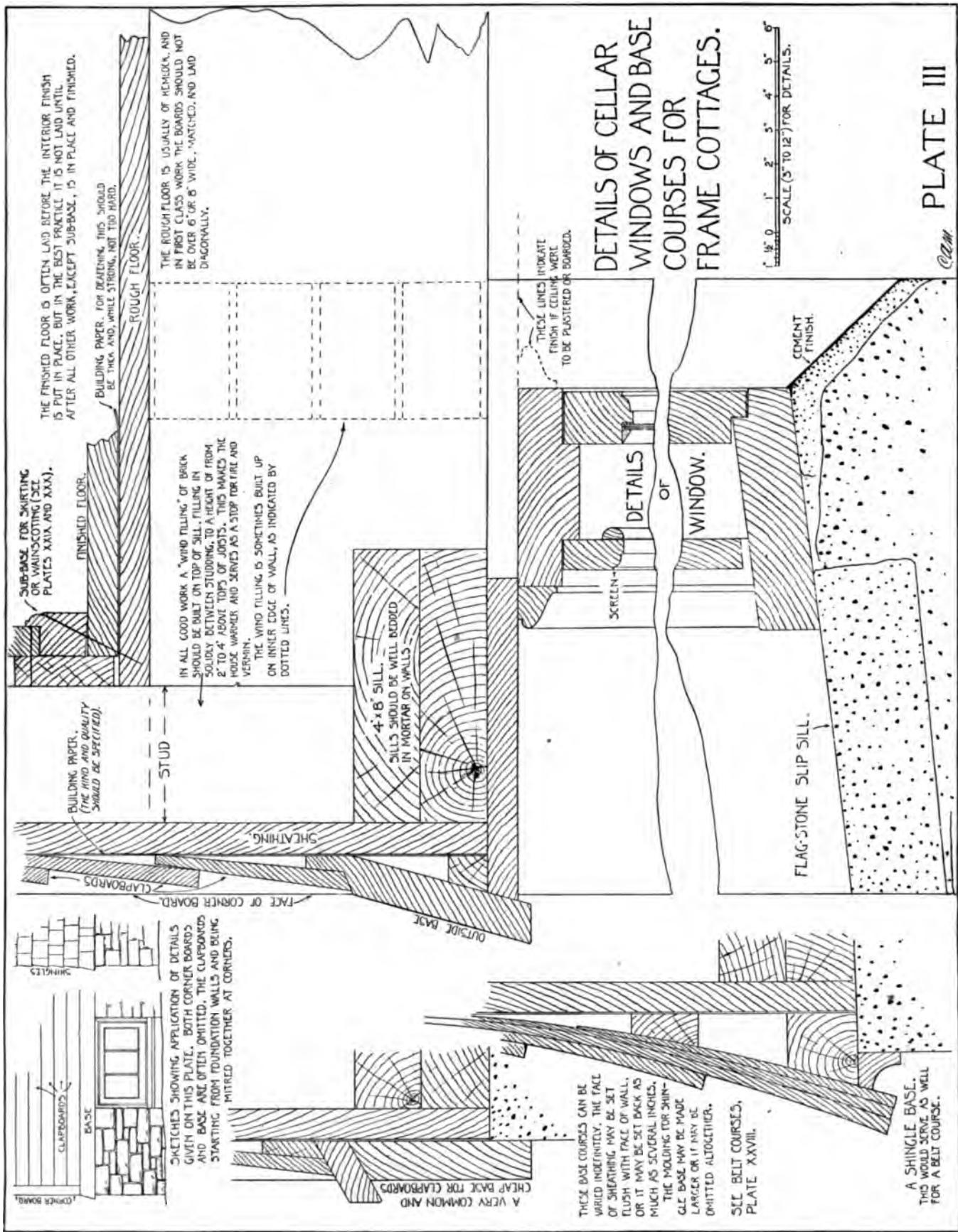
Finished lumber thinner than $\frac{7}{8}$ in. must be planed down or re-sawed from rough lumber 1 in. or more in thickness. Stock ceiling boards that are made for the market in large quantities are commonly $\frac{7}{8}$ in., $\frac{3}{4}$ in., $\frac{5}{8}$ in., $\frac{1}{2}$ in., and $\frac{3}{8}$ in. in thickness and the price gradually scaled down with the thickness so that the $\frac{3}{8}$ in. material is listed at about 60 cent of the price of the $\frac{7}{8}$ in. material. For ordinary finishing, however, where the stock must be gotten out especially for the particular operation, there is little economy in using $\frac{3}{4}$ in., $\frac{5}{8}$ in. or $\frac{1}{2}$ in. material, as the quantity required for any one operation is usually so small that re-sawing cannot be done economically.

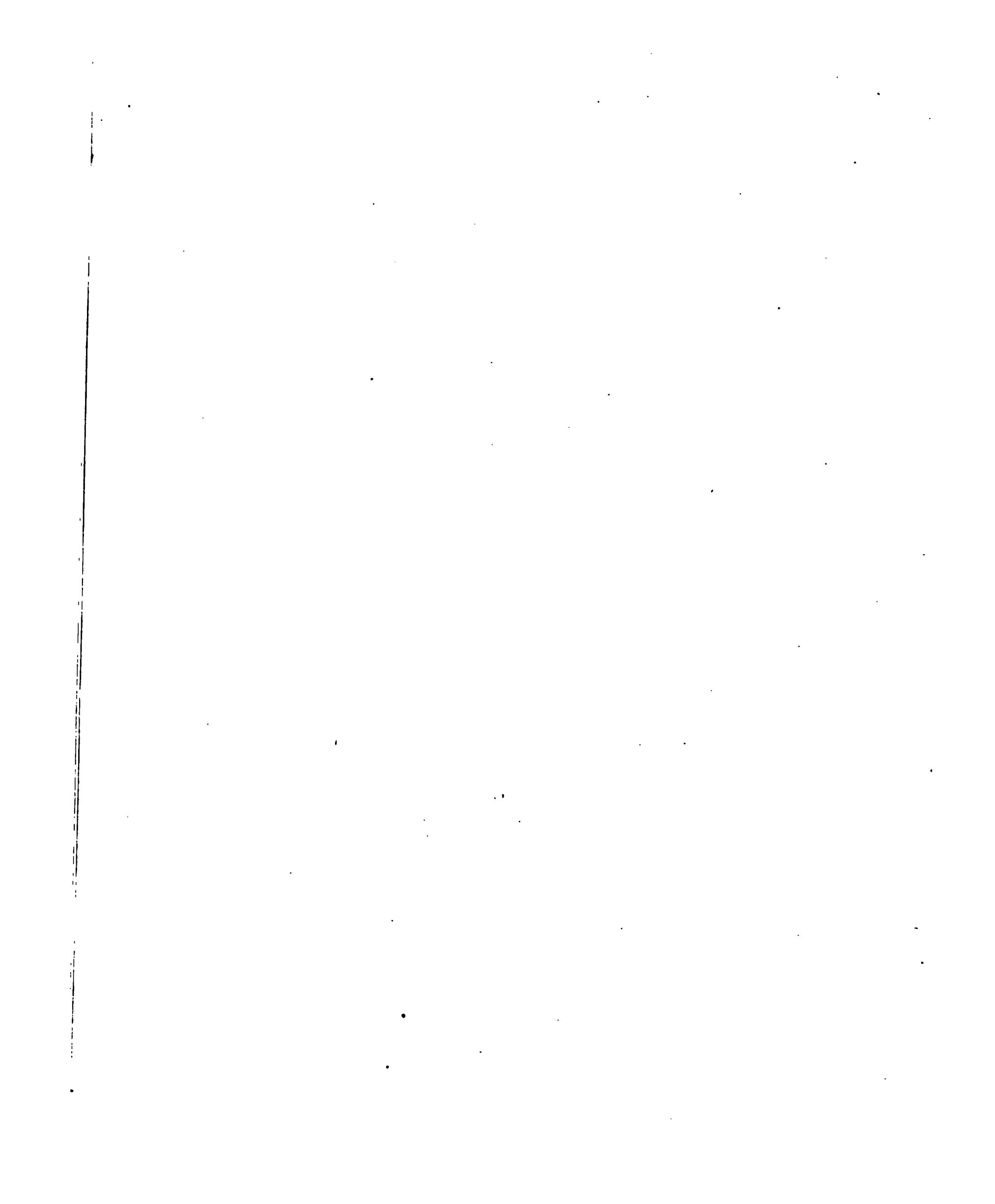












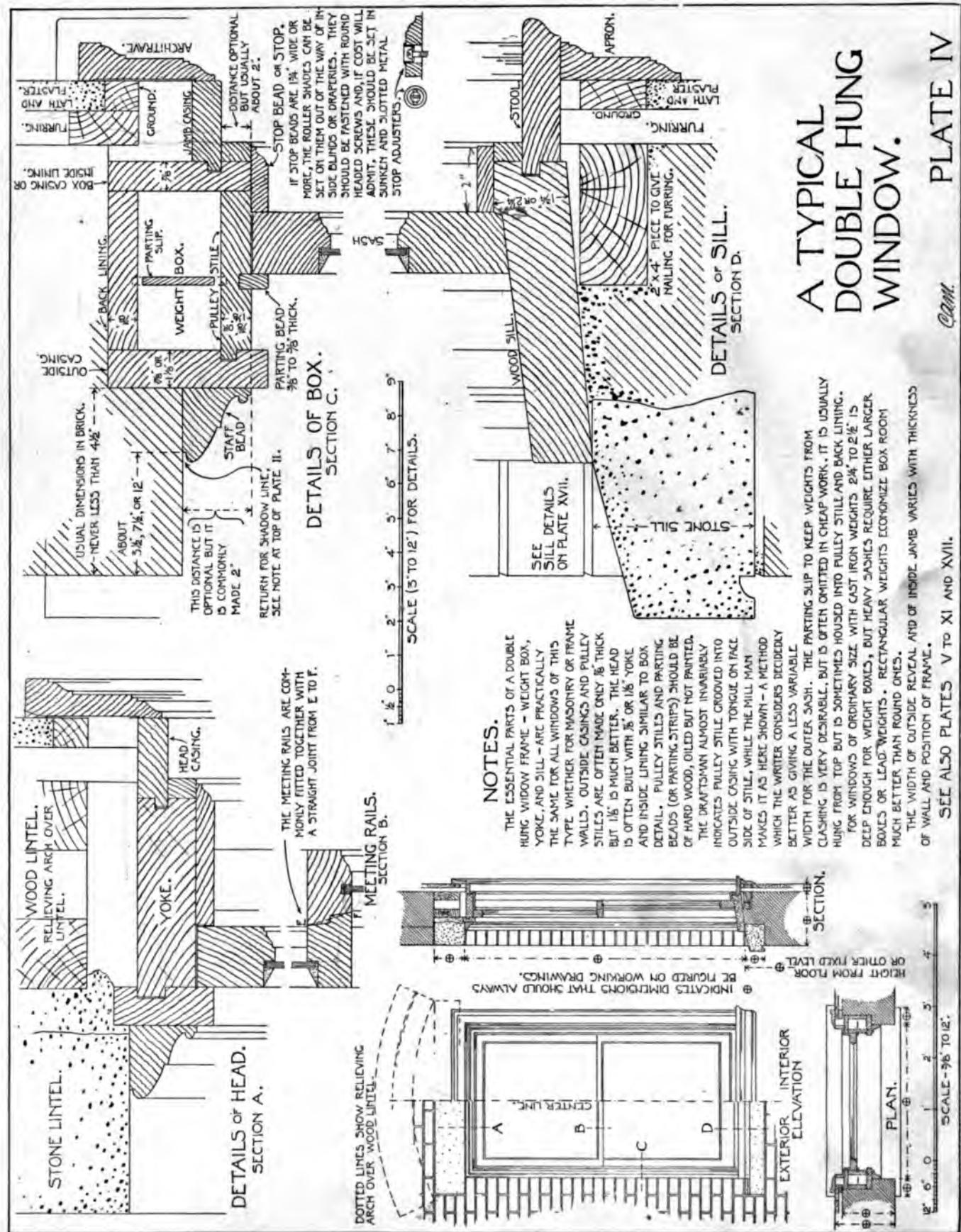


PLATE IV

Cann.

SEE ALSO PLATES V TO XI AND XVII.

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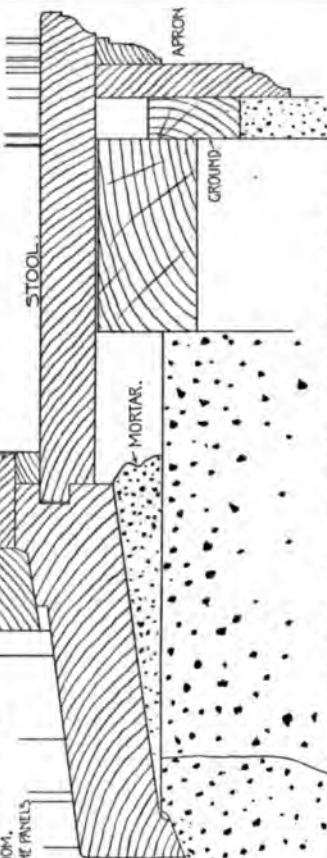
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PLATE V

CAM.

DETAILS OF DOUBLE HUNG WINDOWS WITH INSIDE SHUTTERS.

SCALE FOR LARGE DETAILS.
5' 10" 2' 5" 4' 5' 6' 7' 8'



THE DRAWINGS ON THIS PLATE ARE INTENDED TO SHOW SOME OF THE MORE COMMON WAYS OF HANGING INSIDE SHUTTERS. FROM THESE THE STUDENT CAN EASILY MAKE VARIATIONS TO SUIT ANY GIVEN CASE.

SHUTTERS MAY BE 1, 2, 3, 4 OR EVEN 5 FOLD. THE WIDTH OF FOLD BEING DETERMINED FROM THE AVAILABLE SPACE, AND THIS, WITH WIDTH OF WINDOW, DETERMINING THE NUMBER OF FOLDS. IN NARROW, MULLIONED WINDOWS THE SHUTTERS MAY ALL BE FOLDED AT JAMB'S AND THE MULLIONS LEFT CLEAR, BUT IN WIDER WINDOWS OF THIS KIND IT IS USUALLY NECESSARY TO HANG PART OF THE SHUTTERS ON THE MULLION AS SHOWN ON PLAN NO. 5, PLATE VI.

WHERE DEEP REVEALS ARE WANTED ON THE EXTERIOR, WITH SHUTTER DOORS ON THE INSIDE, IT IS OFTEN NECESSARY TO INCREASE THE THICKNESS OF WALLS BY HEAVY FURNING, OR TO BUILD SHUTTER BOXES OUT INTO THE ROOM.

THERE IS NO RULE AS TO WHAT PROPORTION OF THE PANELS SHALL BE MADE SOLID OR WITH ROLLING SLATS.

NOTES.

THE DRAWINGS ON THIS PLATE ARE INTENDED TO SHOW SOME OF THE MORE COMMON WAYS OF HANGING INSIDE SHUTTERS. FROM THESE THE STUDENT CAN EASILY MAKE VARIATIONS TO SUIT ANY GIVEN CASE.

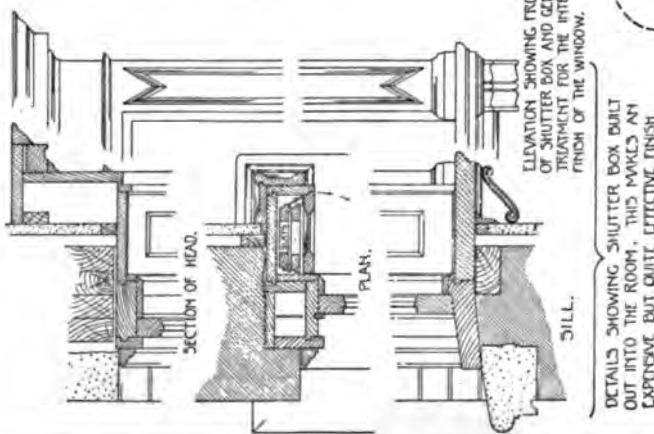
SHUTTERS MAY BE 1, 2, 3, 4 OR EVEN 5 FOLD. THE WIDTH OF FOLD BEING DETERMINED FROM THE AVAILABLE SPACE, AND THIS, WITH WIDTH OF WINDOW, DETERMINING THE NUMBER OF FOLDS. IN NARROW, MULLIONED WINDOWS THE SHUTTERS MAY ALL BE FOLDED AT JAMB'S AND THE MULLIONS LEFT CLEAR, BUT IN WIDER WINDOWS OF THIS KIND IT IS USUALLY NECESSARY TO HANG PART OF THE SHUTTERS ON THE MULLION AS SHOWN ON PLAN NO. 5, PLATE VI.

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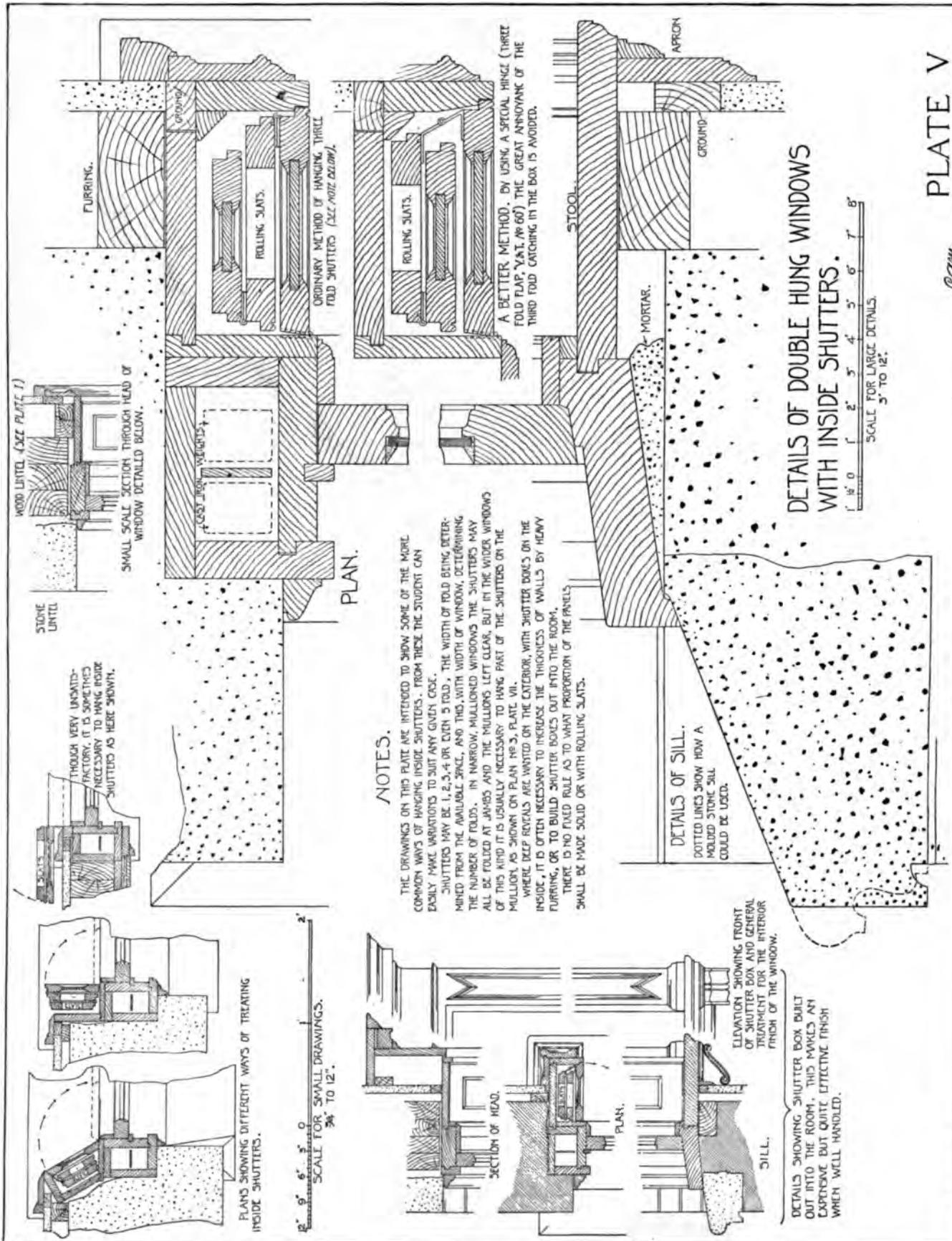
THERE IS NO RULE AS TO WHAT PROPORTION OF THE PANELS SHALL BE MADE SOLID OR WITH ROLLING SLATS.

SCALE FOR SMALL DRAWINGS.
12' 9" 6' 5" 0" 2'

PLANS SHOWING DIFFERENT WAYS OF TREATING
INSIDE SHUTTERS.



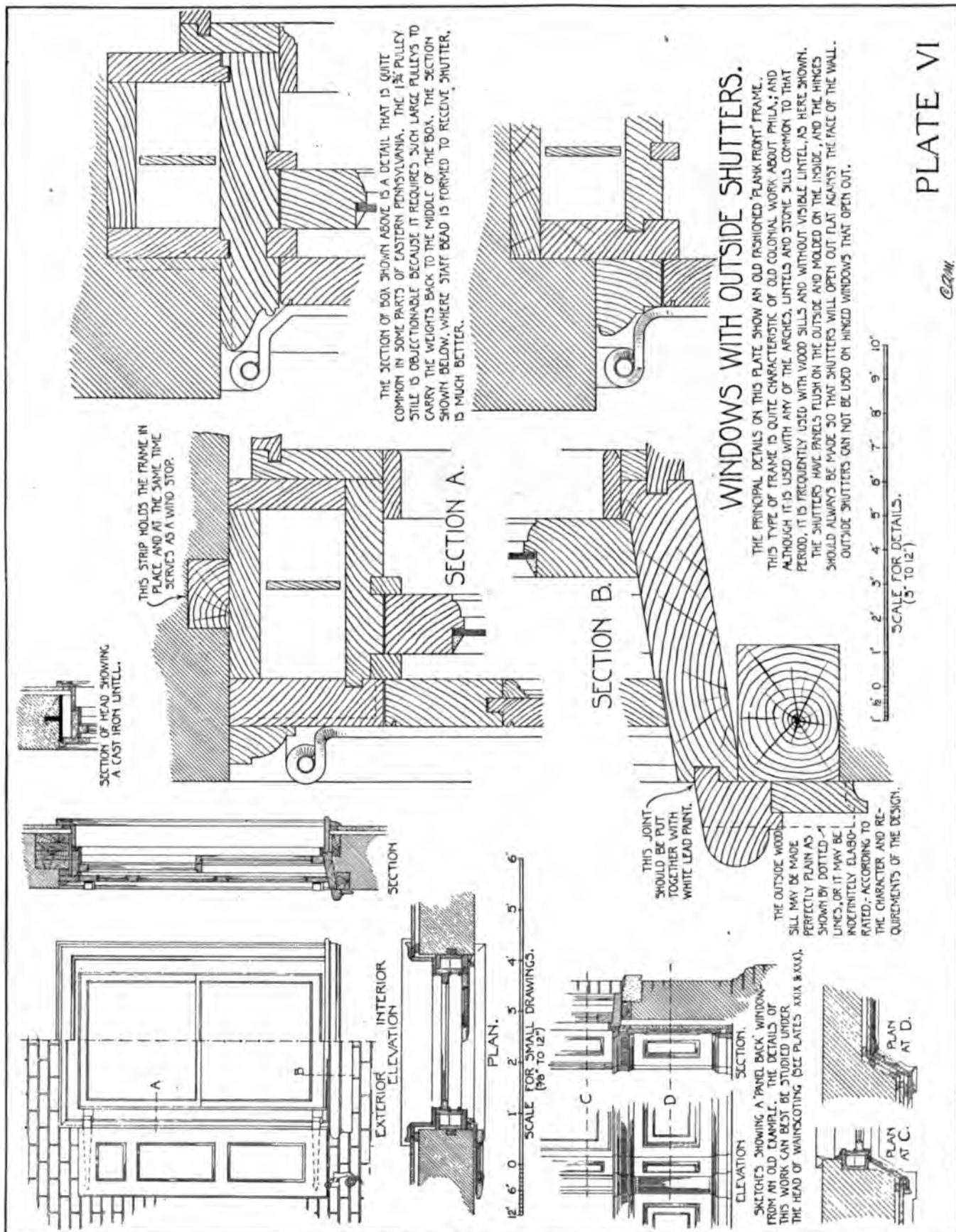
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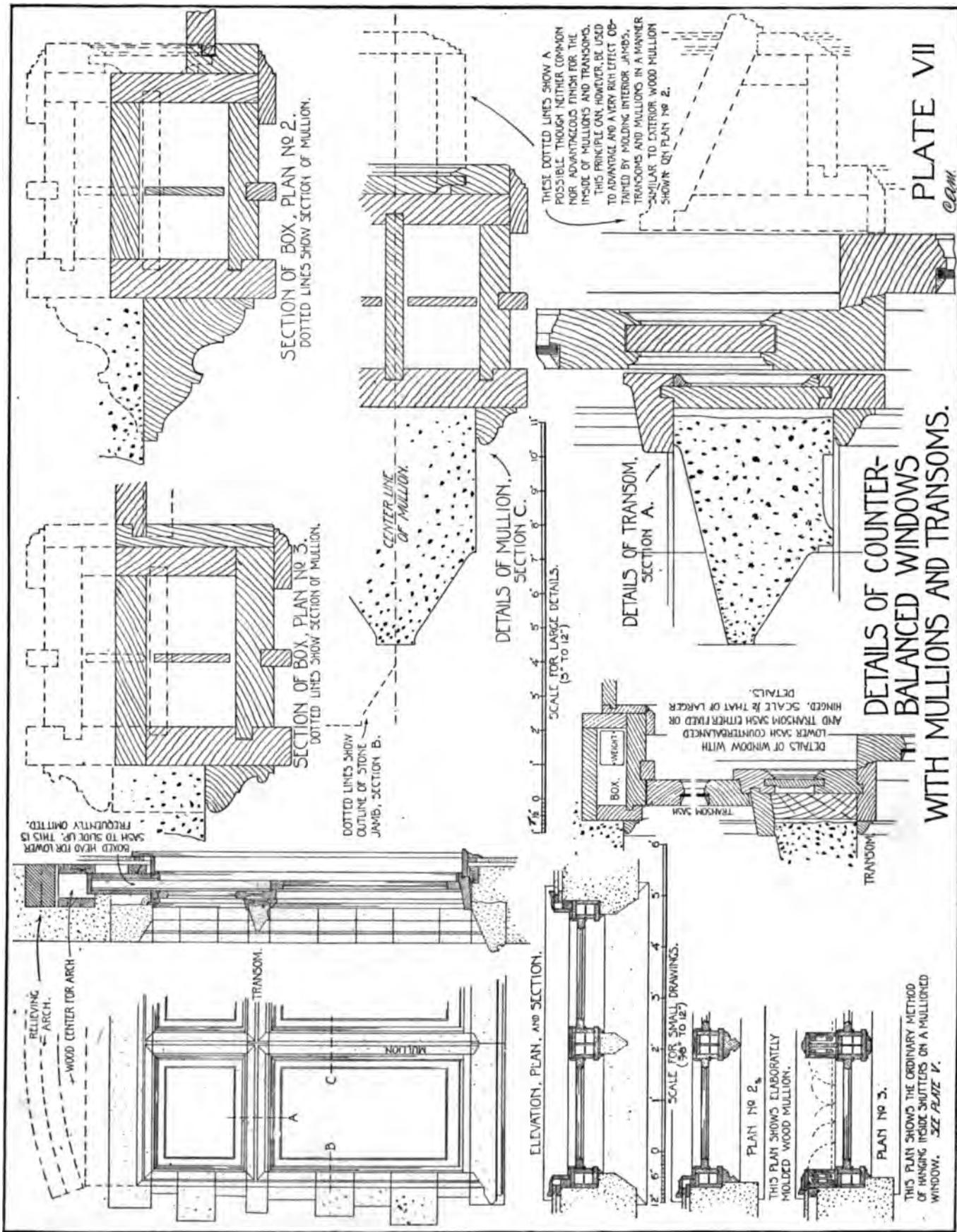
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PLATE VI

C.R.W.









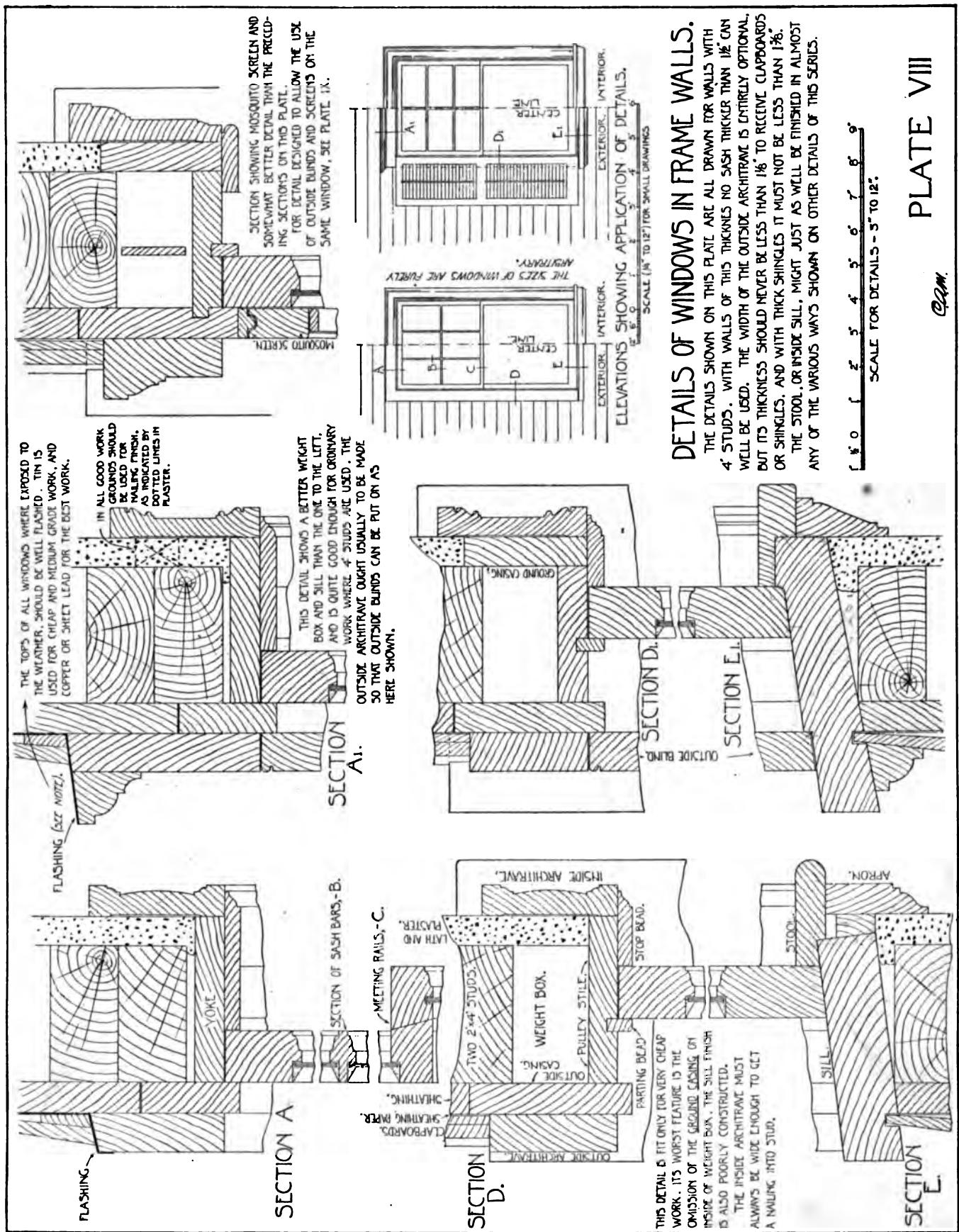




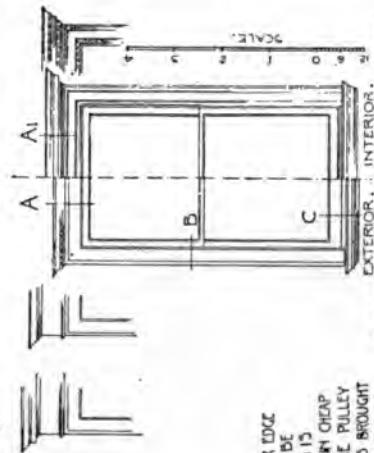
PLATE IX

CAM.

DETAILS OF DOUBLE HUNG
WINDOWS IN FRAME WALLS.

SCALE FOR DETAILS - 5' TO 12'.

A. DETAILS OF CORNICE OVER
TOP OF ARCHITRAVE.
SECTION SHOWING
PICTURE MOLDING AS A
FINISH AT TOP OF ARCHITRAVE.

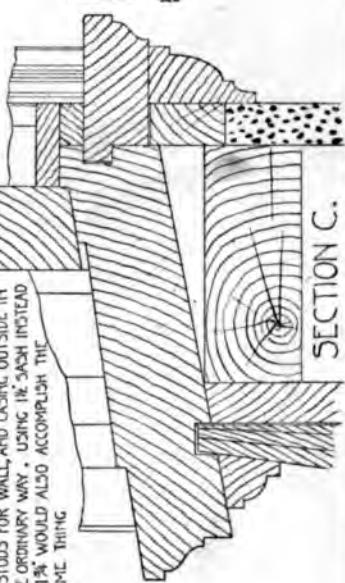


BOTH INTERIOR AND EXTERIOR DETAILS
MAY BE INDIVIDUALLY ELABORATED AS INDICATED BY SMALL SKETCHES ABOVE.

EXTERIOR. — INTERIOR.
ELEVATIONS SHOWING APPLICATION
OF DETAILS.

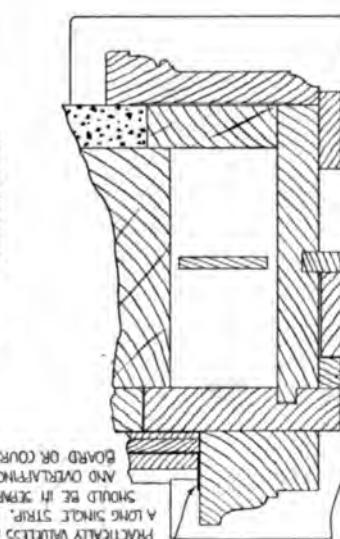
WHERE THE STOP BOARD DOES NOT LAP OVER EDGE
OF ARCHITRAVE A FINISHING PIECE SHOULD BE
INSERTED AT THE ANGLE AS SHOWN. THIS IS QUITE
ESSENTIAL IN ALL GOOD WORK, BUT IN CHEAP
WORK THAT IS TO BE PAINTED THE PULLEY
STILE OR THE GROUND CASING IS BROUGHT
CLEAR OUT TO THE ANGLE AND ALLOWED
TO SHOW AS FINISHED WORK.

IN THIS DETAIL EXTRA WIDTH
IS GIVEN TO THE PULLEY STILE
BY SETTING CASING OUTSIDE OF
BREATHING AND IN THIS WAY MAKING
AMPLE ROOM FOR BOTH OUTSIDE BLINDS
AND SCREENS. THE SAME THING COULD BE
ACCOMPLISHED MORE SATISFACTORILY BY USING
6 STUDS FOR WALL AND CASING OUTSIDE IN
THE ORDINARY WAY. USING 18" SASH INSTEAD
OF 15" WOULD ALSO ACCOMPLISH THE
SAME THING.

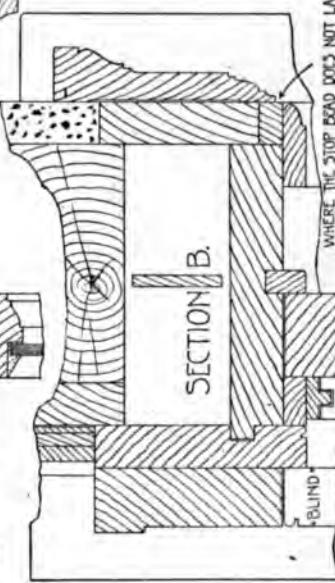


SECTION C.

BY INSERTING A $\frac{1}{8}$ " PIECE HERE
ADDITIONAL SPACE IS GIVEN SO
THAT IT IS POSSIBLE TO HAVE
BOTH BLINDS AND MOSQUITO
SCREEN OUTSIDE OF SASH.
THE SASH IS STILL SO NARROW, HOWEVER,
THAT THE SCREEN WOULD EITHER HAVE TO
BE CUT OUT A LITTLE BIT AT THE BOTTOM OR
SLIGHTLY RAISED FROM JAMB TO GIVE ROOM
FOR BLIND CATCHES WHEN BLINDS ARE
CLOSED.

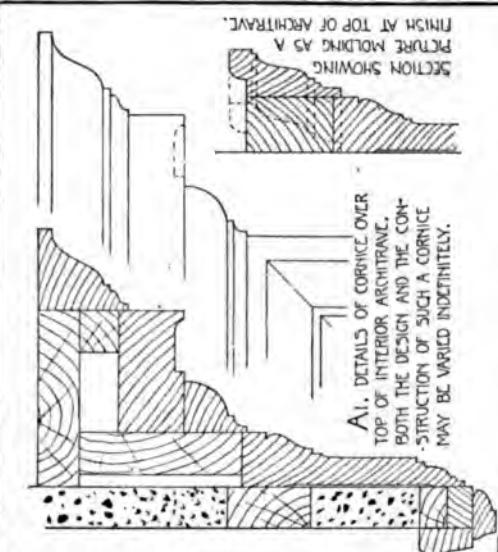


SECTION B.

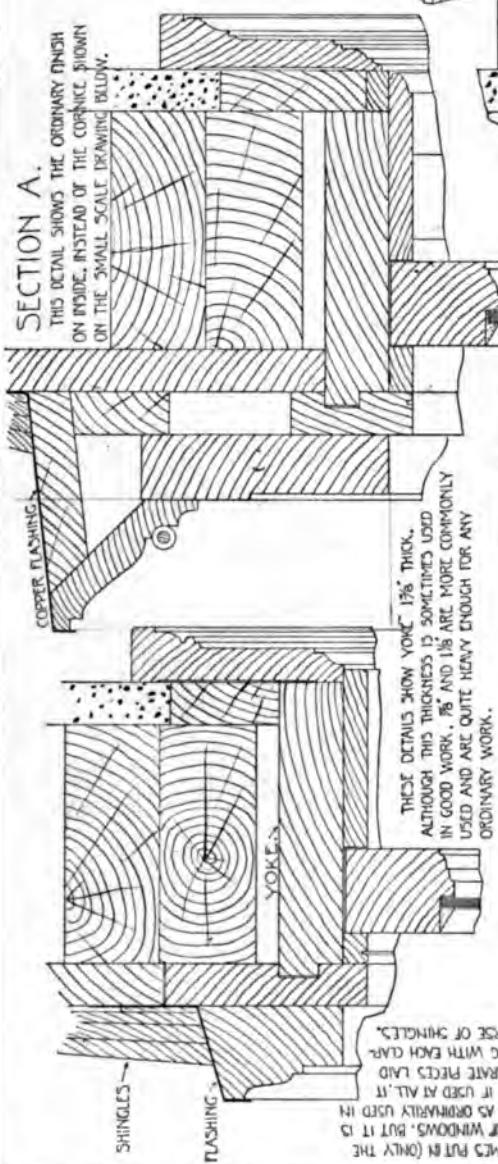


SECTION A.

THIS DETAIL SHOWS THE ORDINARY FINISH
ON INSIDE, INSTEAD OF THE CORNICE SHOWN
ON THE SMALL SCALE DRAWING BELOW.



A1. DETAILS OF CORNICE OVER
TOP OF ARCHITRAVE.
BOTH THE DESIGN AND THE CON-
STRUCTION OF SUCH A CORNICE
MAY BE VARIED INDEFINITELY.

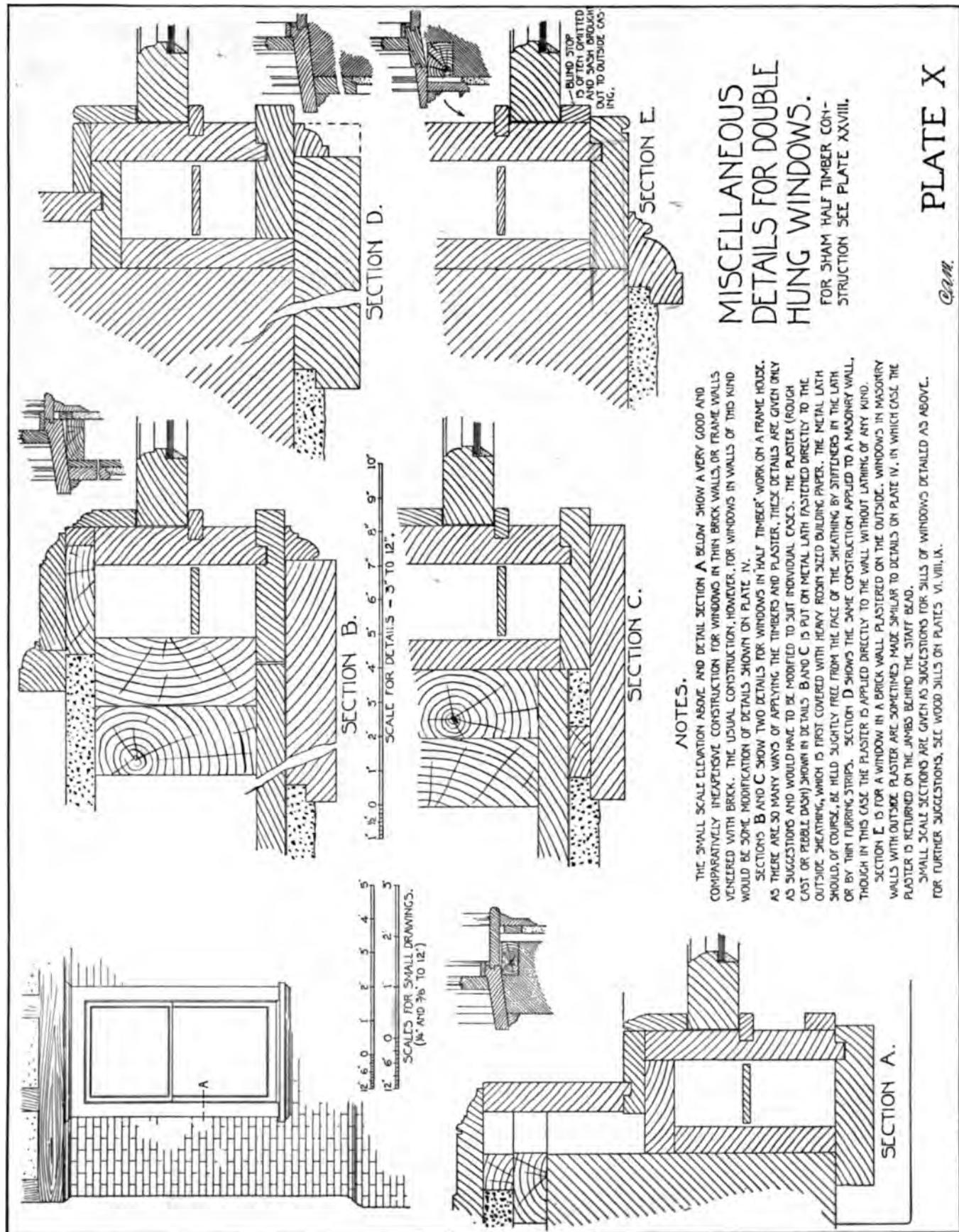


THESE DETAILS SHOW YONG $1\frac{1}{8}$ " THICK,
ALTHOUGH THIS THICKNESS IS SOMETIMES USED
IN GOOD WORK. $1\frac{1}{8}$ " AND $1\frac{1}{4}$ " ARE MORE COMMONLY
USED AND ARE QUITE HEAVY ENOUGH FOR ANY
ORDINARY WORK.

SHINGLES
FLASHING

FLASHING IS SOMETIMES PUT IN ONLY THE
BEST WORK AT SIDES OF WINDOWS. BUT IT IS
PARTICULARLY USEFUL AS ORDINARILY USED IN
A LONG SINGLE STRIP, IT DEPARTS WITH EACH LAD
SHOULD BE IN SEPARATE PIECES AND
BOARD OR COURSE OF SHINGLES.

BY INSERTING A $\frac{1}{8}$ " PIECE HERE
ADDITIONAL SPACE IS GIVEN SO
THAT IT IS POSSIBLE TO HAVE
BOTH BLINDS AND MOSQUITO
SCREEN OUTSIDE OF SASH.
THE SASH IS STILL SO NARROW, HOWEVER,
THAT THE SCREEN WOULD EITHER HAVE TO
BE CUT OUT A LITTLE BIT AT THE BOTTOM OR
SLIGHTLY RAISED FROM JAMB TO GIVE ROOM
FOR BLIND CATCHES WHEN BLINDS ARE
CLOSED.



NOTES.

THE SMALL SCALE ELEVATION ABOVE, AND DETAIL SECTION A BELOW, SHOW A VERY GOOD AND COMPARATIVELY INEXPENSIVE CONSTRUCTION FOR WINDOWS IN THIN BRICK WALLS, OR FRAME WALLS VENEERED WITH BRICK. THE USUAL CONSTRUCTION, HOWEVER, FOR WINDOWS IN WALLS OF THIS KIND WOULD BE SOME MODIFICATION OF DETAILS SHOWN ON PLATE IV.

SECTIONS B AND C SHOW TWO DETAILS FOR WINDOWS IN HALF TIMBER WORK ON A FRAME HOUSE. AS THERE ARE SO MANY WAYS OF APPLYING THE TIMBERS AND PLASTER, THESE DETAILS ARE GIVEN ONLY AS SUGGESTIONS, AND WOULD HAVE TO BE MODIFIED TO SUIT INDIVIDUAL CASES. THE PLASTER (ROUGH CAST OR PEBBLE DASH) SHOWN IN DETAILS B AND C IS PUT ON METAL LATH FASTENED DIRECTLY TO THE OUTSIDE SHEATHING, WHICH IS FIRST COVERED WITH HEAVY RODIN ZEED BUILDING PAPER. THE METAL LATH SHOULD, OF COURSE, BE HELD SLIGHTLY FREE FROM THE FACE OF THE SHEATHING BY SPACERS IN THE LATH, OR BY THIN TURNING STRIPS. SECTION D SHOWS THE SAME CONSTRUCTION APPLIED TO A MASONRY WALL, THOUGH IN THIS CASE THE PLASTER IS APPLIED DIRECTLY TO THE WALL WITHOUT LATHING OF ANY KIND.

SECTION E IS FOR A WINDOW IN A BRICK WALL PLASTERED ON THE OUTSIDE. WINDOWS IN MASONRY WALLS WITH OUTSIDE PLASTER ARE SOMETIMES MADE SIMILAR TO DETAILS ON PLATE IV, IN WHICH CASE THE PLASTER IS RETURNED ON THE JAMBS BEHIND THE STAFF BEAD.

SMALL SCALE SECTIONS ARE GIVEN AS SUGGESTIONS FOR SILLS OF WINDOWS DETAILED AS ABOVE. FOR FURTHER SUGGESTIONS, SEE WOOD SILLS ON PLATES VI, VIII, IX.

MISCELLANEOUS DETAILS FOR DOUBLE HUNG WINDOWS.

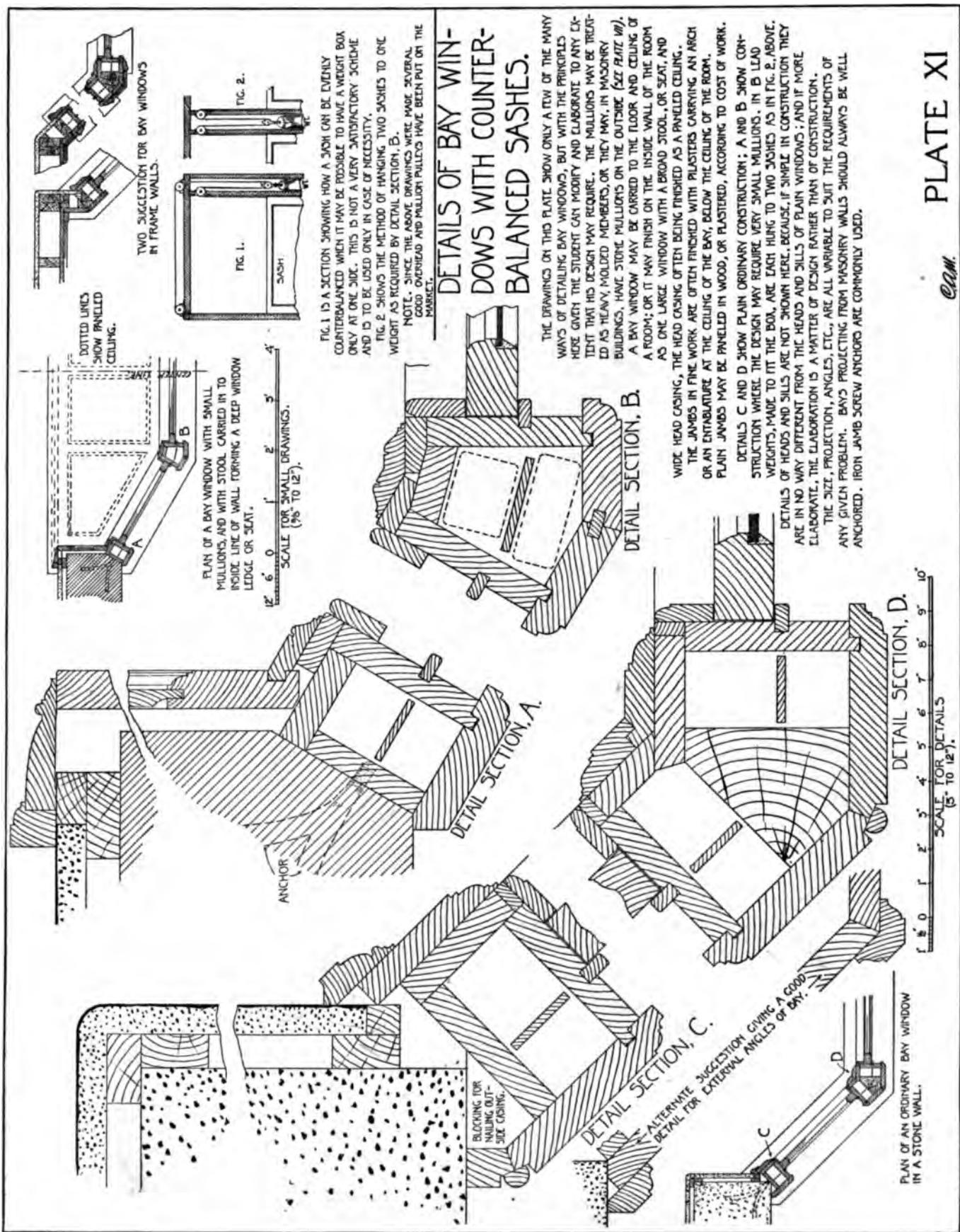
FOR SHAM HALF TIMBER CONSTRUCTION SEE PLATE XXVIII.

PLATE X

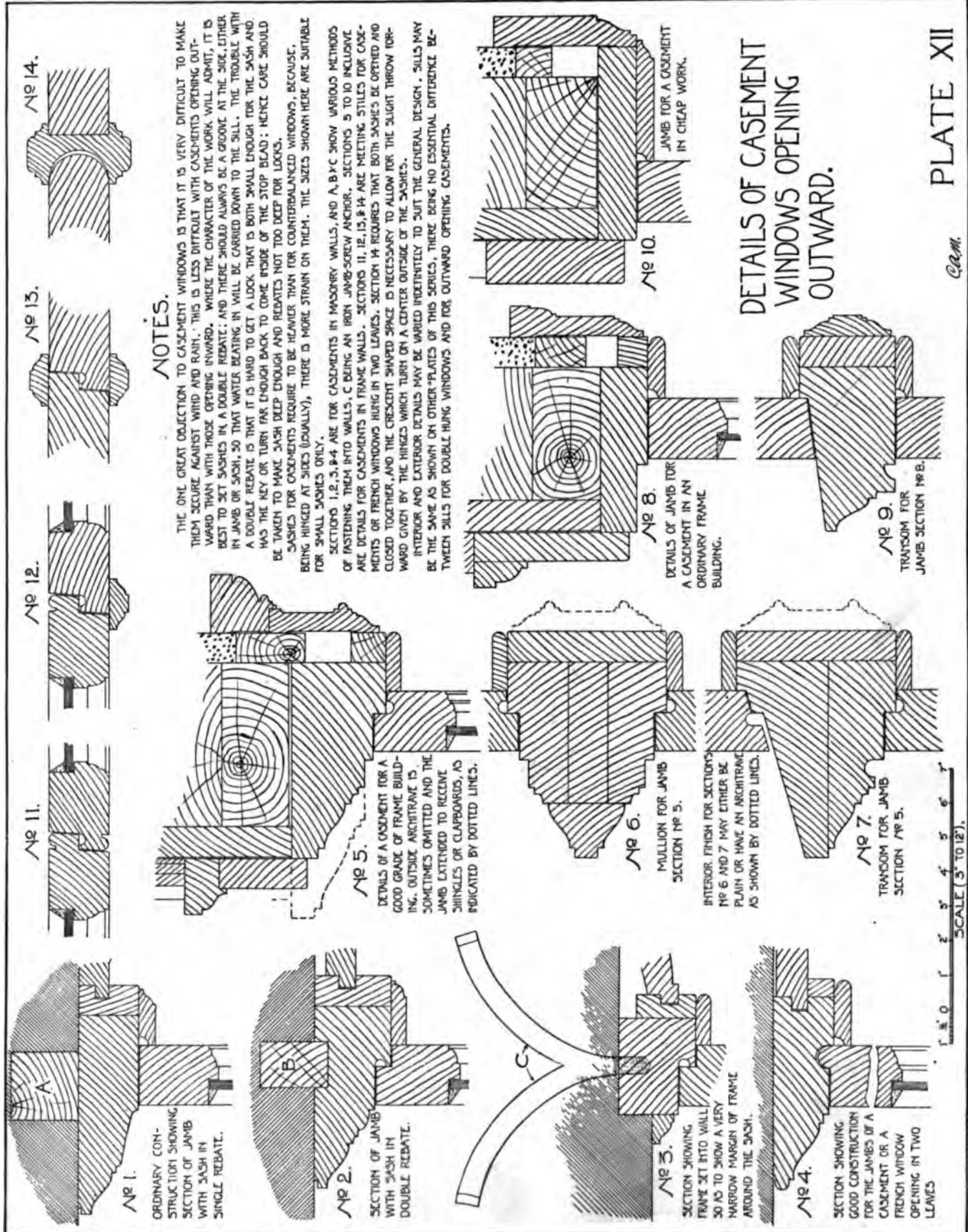
C.P.W.

PLATE XI

©AM.





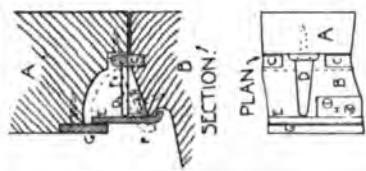


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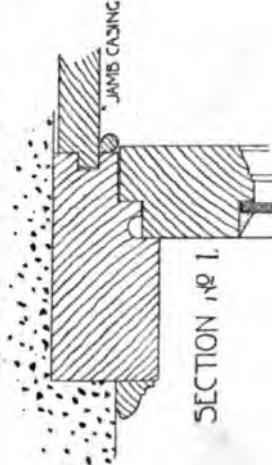


DETAILS AND DESCRIPTION FROM THE
"DICTIONARY OF ARCHITECTURE,
DOED BY THE ARCHITECTURAL PUBLICATION
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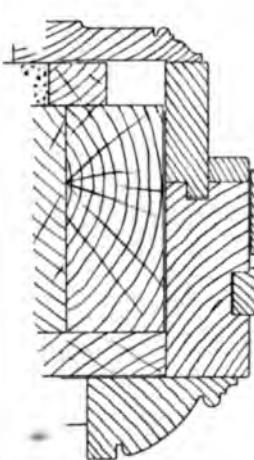
"A NEW KIND OF WATER BAR FOR FRENCH
CASEMENTS POSSESSING MANY ADVANTAGES, AND
WHICH HAS PROVED SUCCESSFUL IN USE FOR SOME
YEARS. IT IS ALSO APPLICABLE TO EXTERNAL DOORS.
AS WHEN THE WATER BAR IS FORCED DOWN BY THE
COVER FILLET, THE APPARATUS OFFERS NO IMPEDIMENT
TO THE FOOT, AND WHEN RAISED IS ABSOLUTELY
WEATHER-TIGHT. A. SECTION OF A 2½ CASEMENT.
B. SILL. C. METAL BEAD, WITH OPENINGS FOR AN ARM, D.
TO MOVE THROUGH, AS SHewn IN PLATE. D. METAL ARM
FIXED TO CASEMENT (ONE IN THE CENTER OF EACH CASEMENT),
TO LIFT THE WATER BAR. E. IN CLOSING THE CASEMENT.
E. METAL WATER BAR, HINGED AT H. LIFTED BY THE ARM,
D, AND FORCED BY IT AGAINST G, A METAL COVER
FILLET FASTENED TO THE OUTSIDE OF THE CASEMENT.
F. SHOWS THE POSITION OF THE WATER BAR WHEN THE CASEMENT IS OPEN TO
ALLOW THE COVER FILLET, G, TO PASS OVER IT. THIS ARRANGEMENT IS FOUND
IN PRACTICE TO BE MOST EFFICIENT, AND TO KEEP FOR A LONG TIME IN PERFECT
WORKING ORDER.



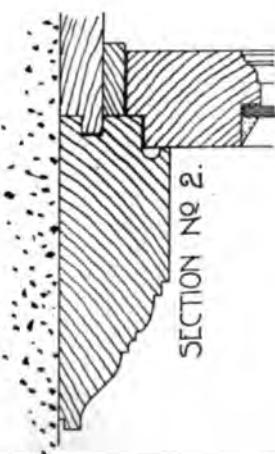
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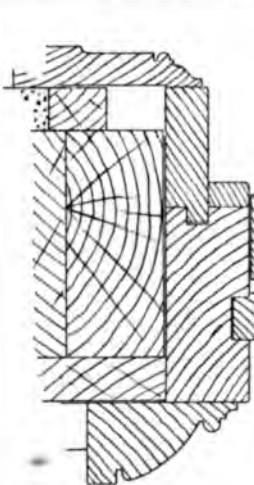
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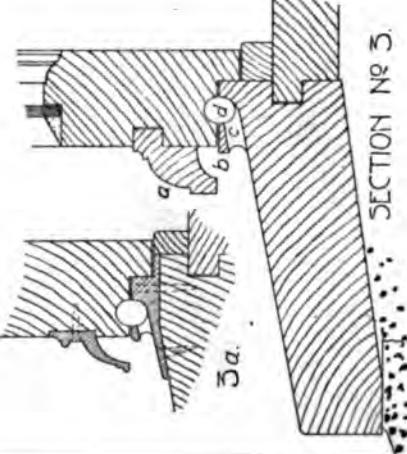
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SECTION NO. 4.



SECTION NO. 5.

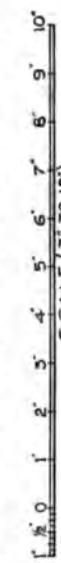


SECTION NO. 6.

NOTES. THE SPECIAL DIFFICULTY ALWAYS MET WITH IN CASEMENTS OPENING IN IS THAT IT IS NEAT TO IMPOSSIBLE TO MAKE
SILLS THAT ARE PERFECTLY WEATHER-PROOF. SECTIONS 1, 2, 4, AND 5 SHOW VARIOUS JAMB SECTIONS ADAPTABLE TO DIFFERENT KINDS
OF WORK. SILL SECTION NO. 6 IS A GOOD ENOUGH FORM FOR CHEAP WORK OR WHERE WINDOWS ARE WELL SHELTERED. NO. 5 IS
A MORE ELABORATE AND CAREFULLY STUDIED SECTION: THE DRIP MOLDING, a, CARRIES THE WATER OUT AND AWAY FROM THE JOINT AT
THE BOTTOM OF SASH, THE RAISED LIP b, ON SILL, TENDS TO TURN BACK WATER THAT THE WIND WOULD OTHERWISE DRIVE IN UNDER THE
SASH, WHILE ANY WATER THAT MAY FINALLY GET INSIDE OF THIS POINT IS COLLECTED IN THE GROOVE d AND CARRIED OUT THROUGH THE
HOLES e WHICH ARE ¾" IN DIAMETER AND ABOUT 5' OR 6' APART. IT WOULD BE AN IMPROVEMENT IF THE ESSENTIAL FEATURES OF NO. 5
COULD BE MADE IN STEEL OR BRONZE AS SUGGESTED BY SECTION 3a.
IN ENGLAND CASEMENTS ARE FREQUENTLY MADE WITH FRAMES AND SASHES OF IRON, AND THE FORMS OF CONSTRUCTION USED TO
EXCLUDE WIND AND RAIN ARE SOMETIMES VERY ELABORATE.

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DETAILS OF CASEMENT
WINDOWS OPENING IN.



READ NOTES ON PLATE XII. SEE ALSO PLATES XIV, XV, & XVI.

PLATE XIII

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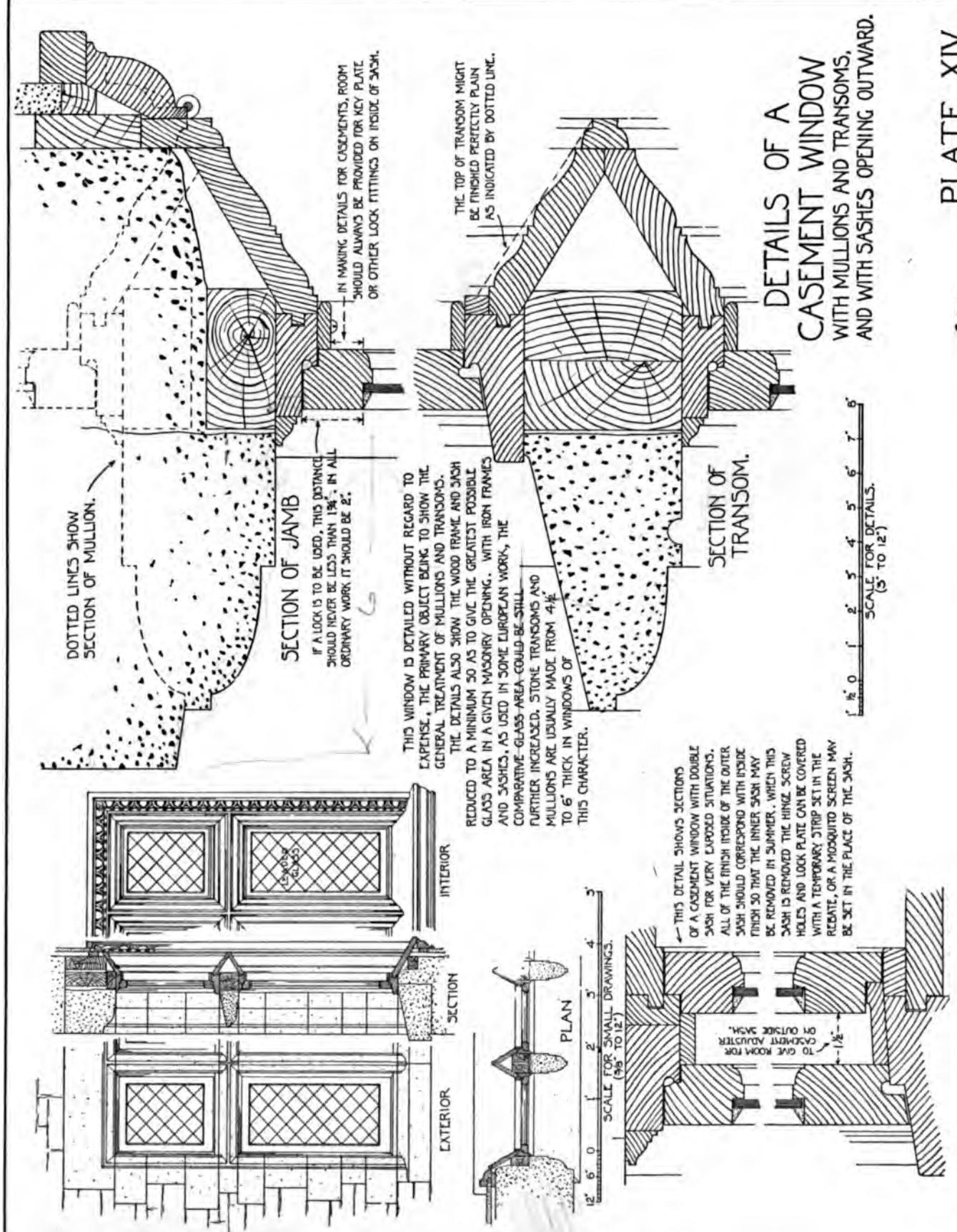
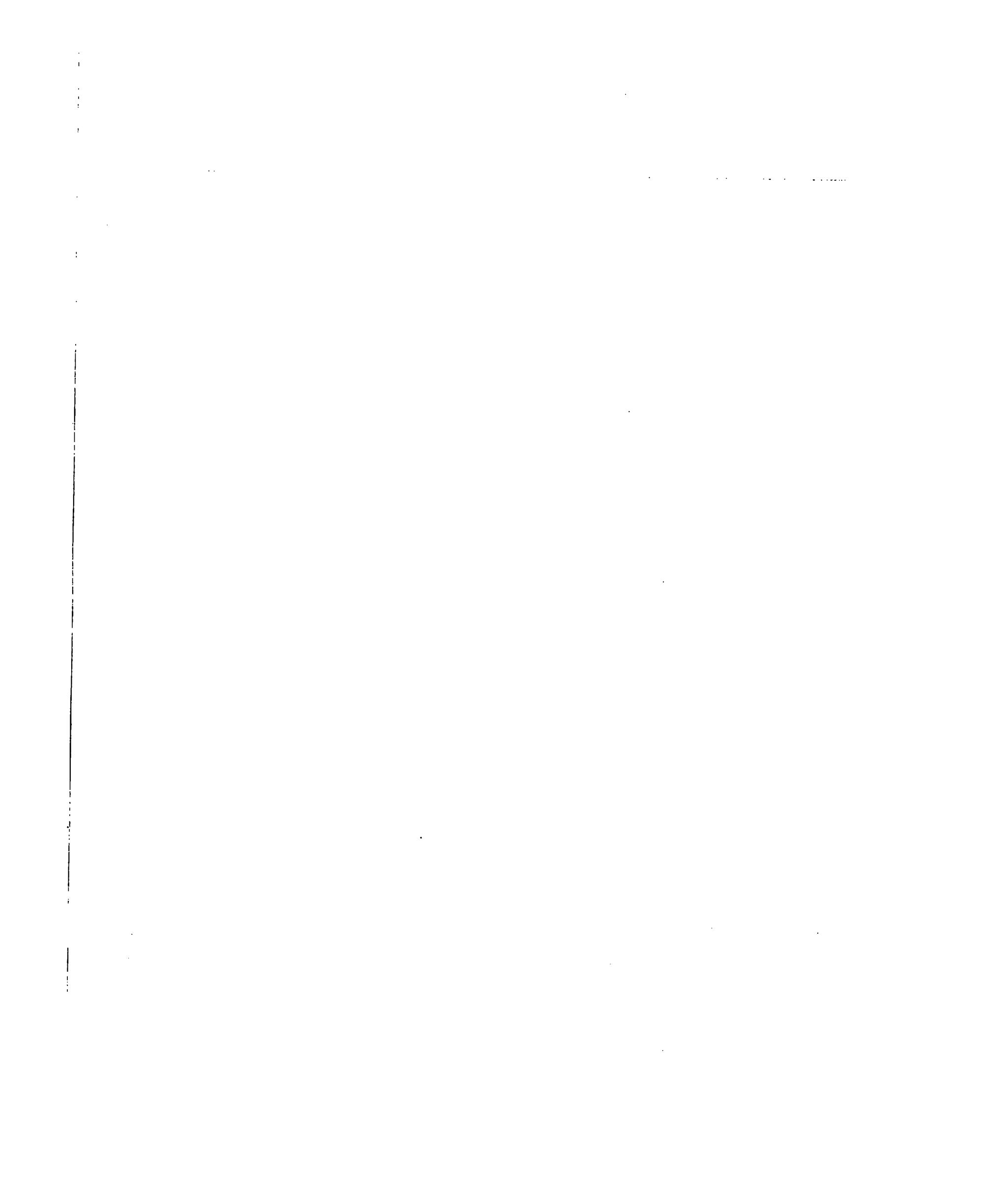
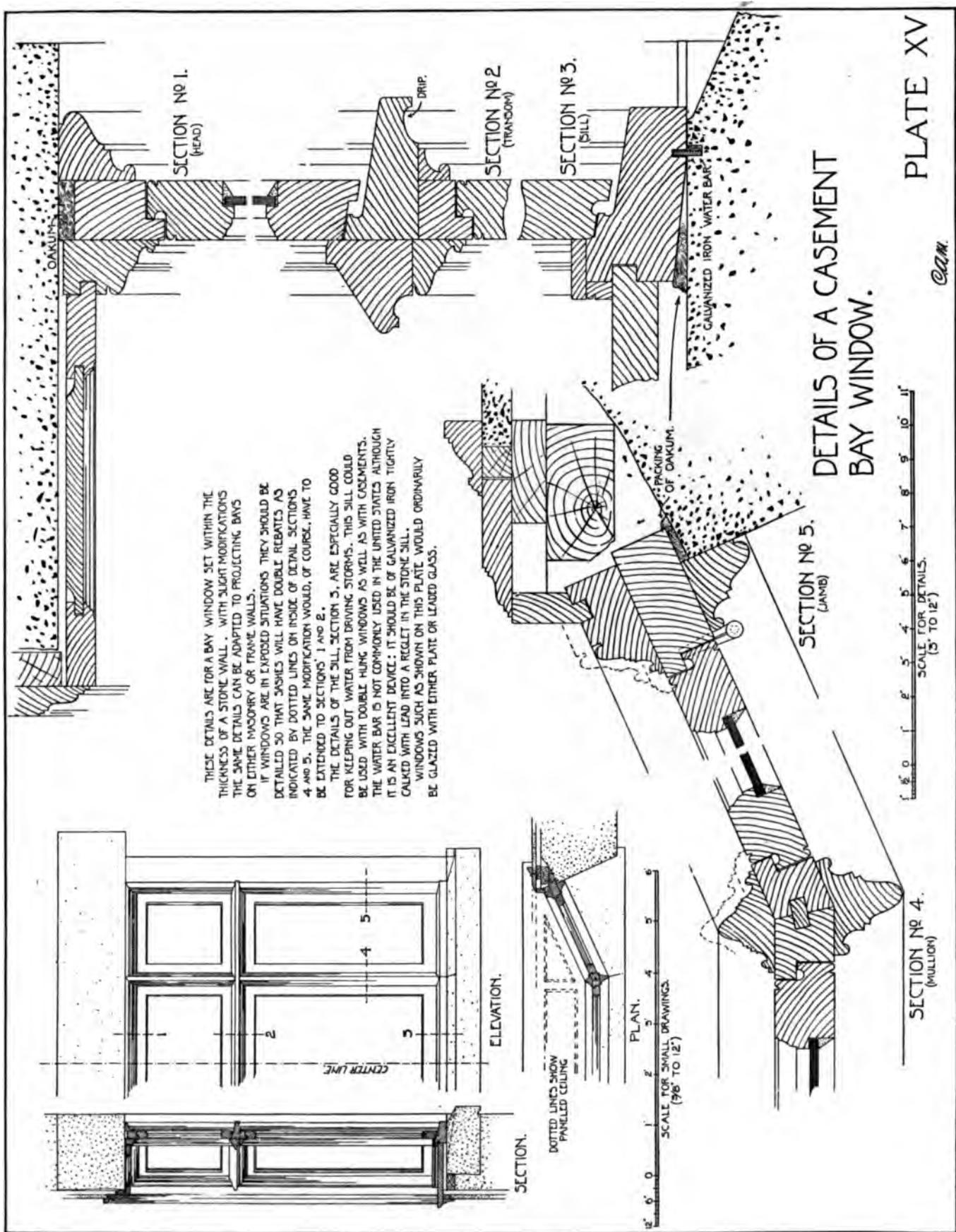


PLATE XIV

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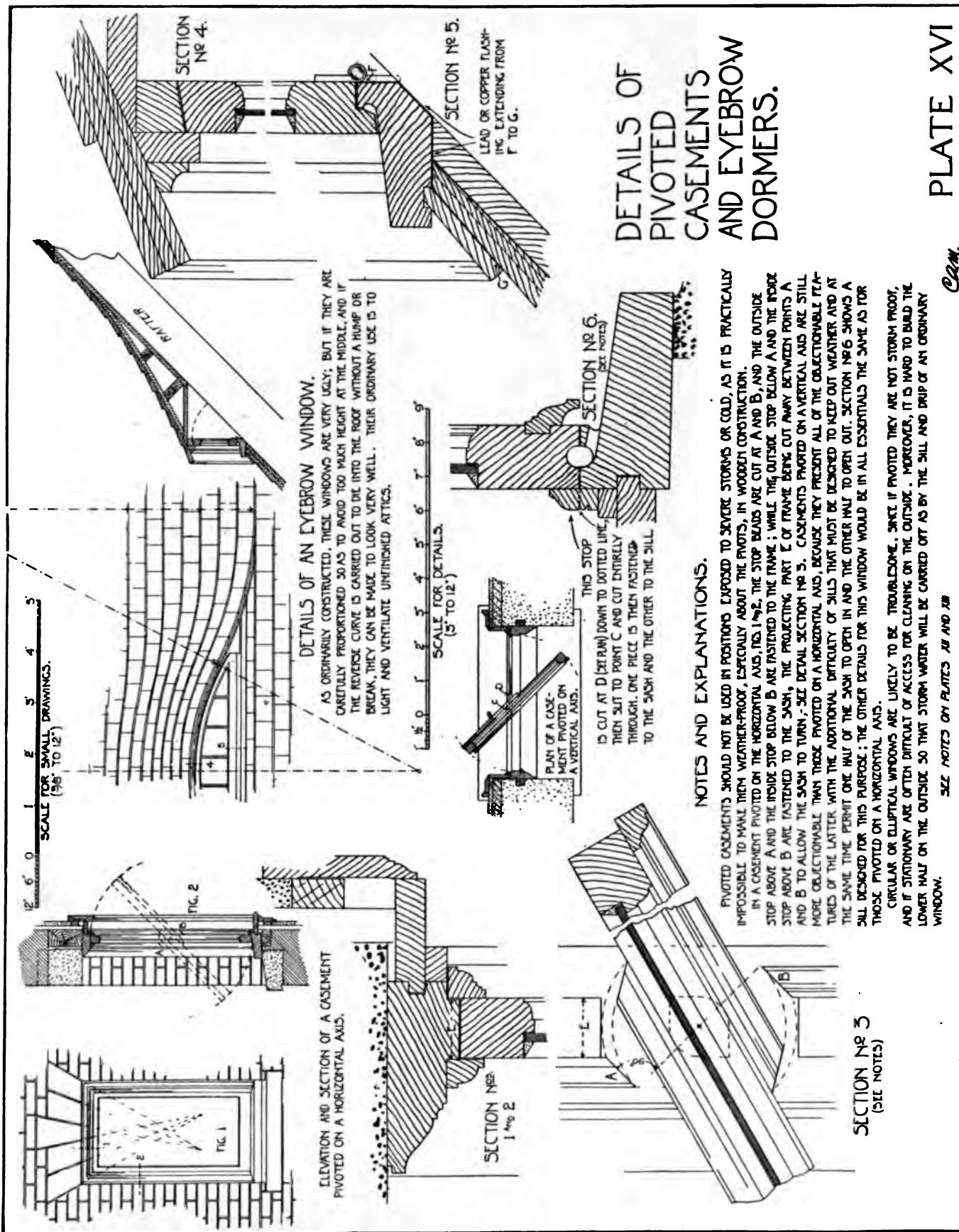
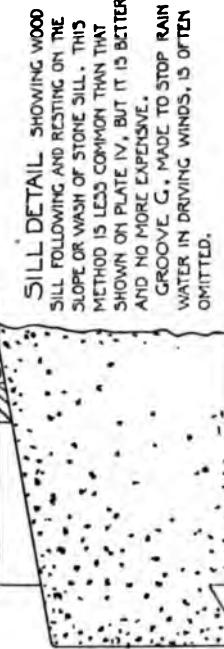


PLATE XVI

CAM.

STORM RESISTING WINDOWS.

STORM SASHES COULD BE USED IN PLACE OF OUTSIDE SHUTTERS OR BLINDS WITH DETAILS ON PLATES VI, VIII, AND IX.



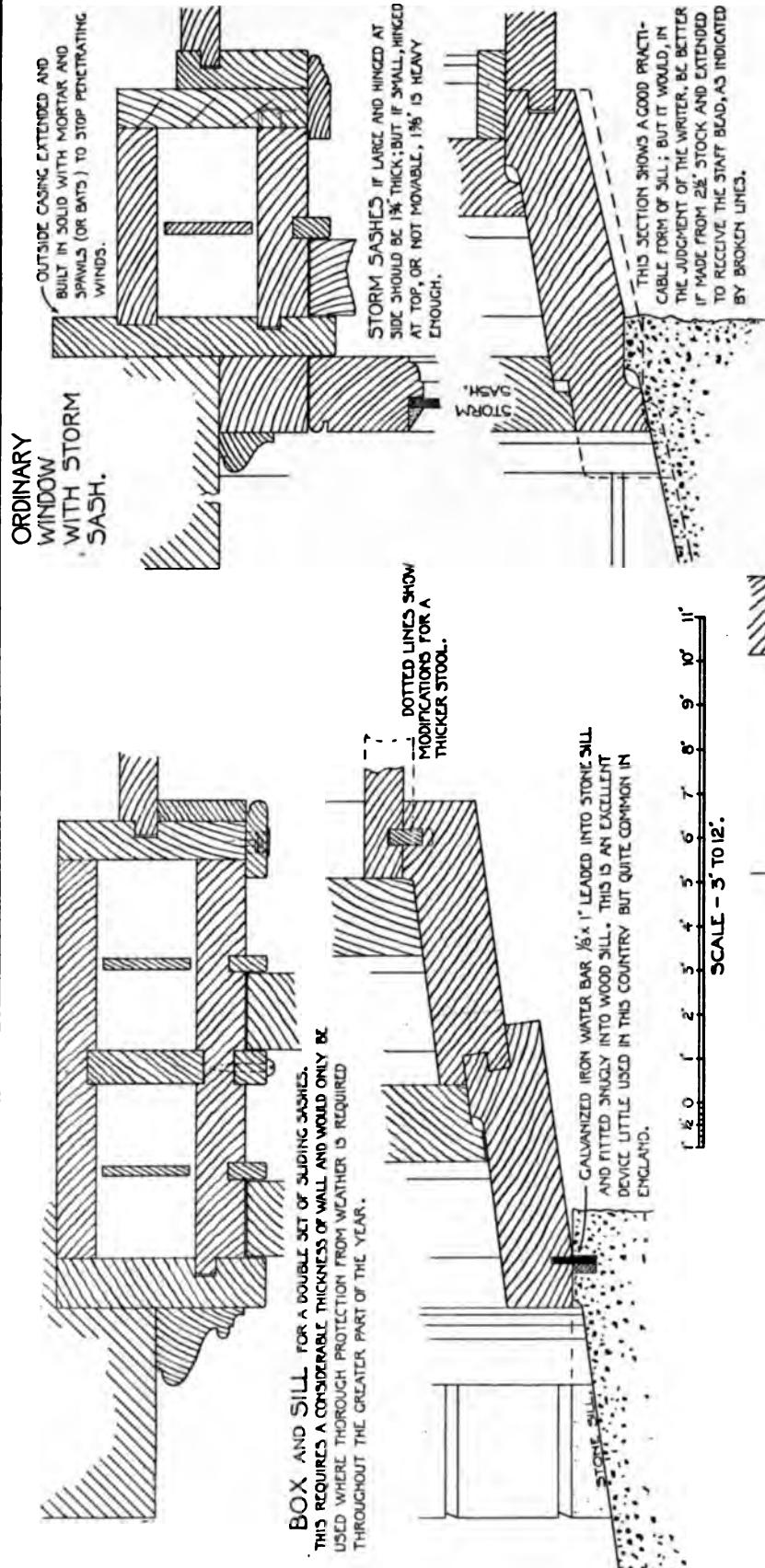
SILL DETAIL SHOWING WOOD SILL FOLLOWING AND RESTING ON THE SLOPE OR WASH OF STONE SILL. THIS METHOD IS LESS COMMON THAN THAT SHOWN ON PLATE IV, BUT IT IS BETTER AND NO MORE EXPENSIVE.

GROOVE C, MADE TO STOP RAIN WATER IN DRIVING WINDS, IS OFTEN OMITTED.

DOUBLE GLAZED SASHES.

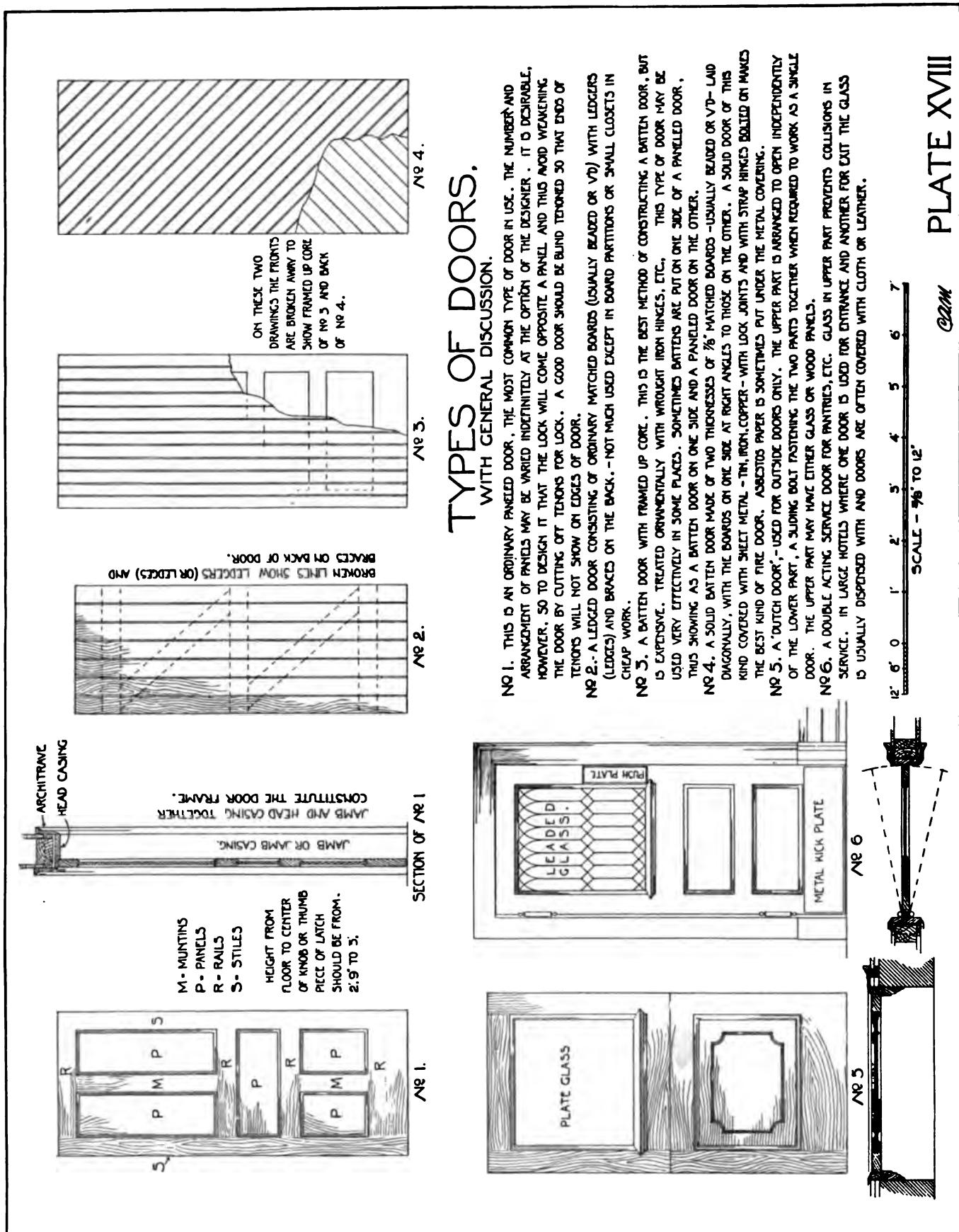
PUTTY OUTSIDE AND MOLDING INSIDE.
BUT ALL GLASS BEDDED IN PUTTY.

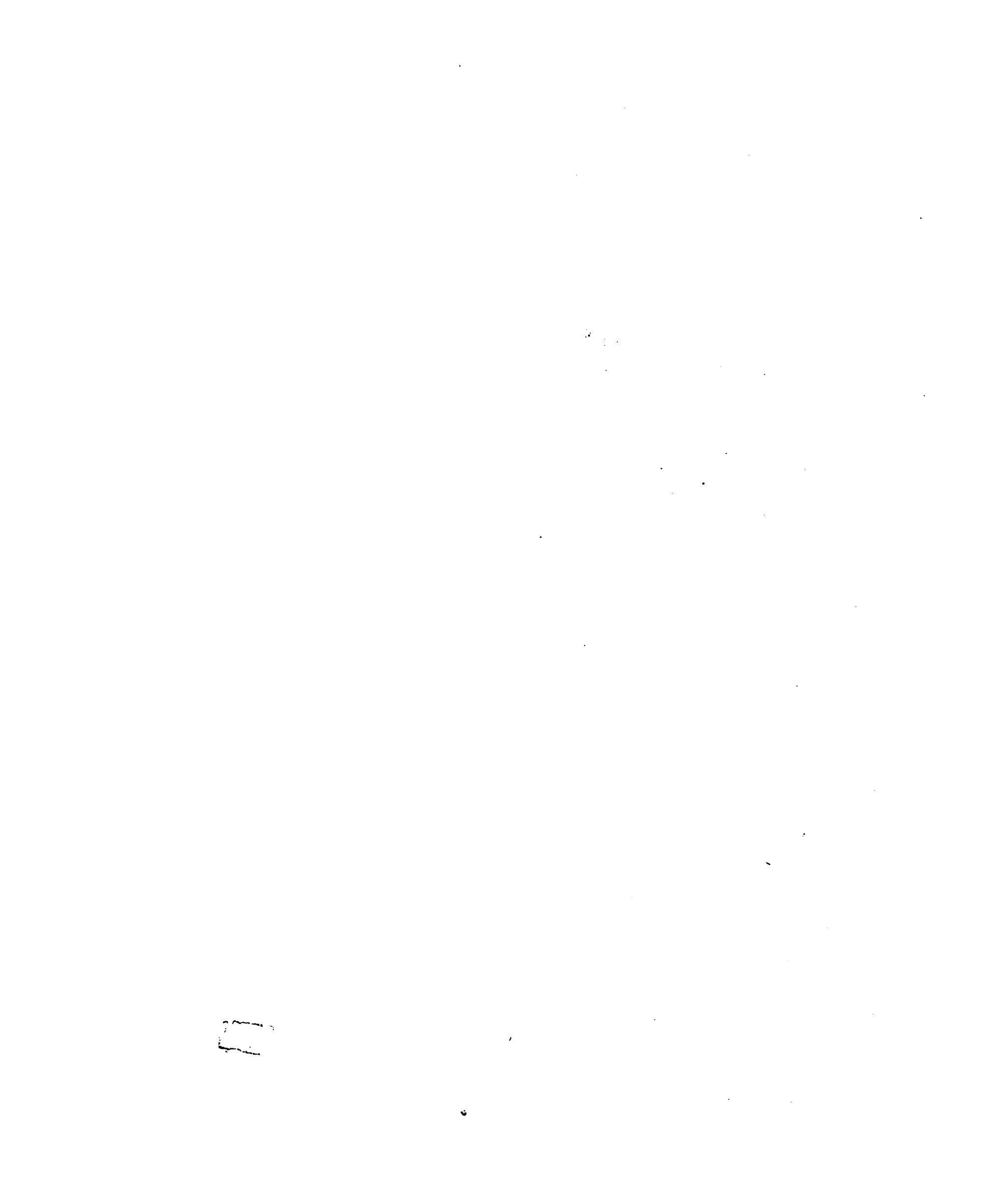
SASHES ARE SOMETIMES DOUBLE GLAZED AS A PROTECTION AGAINST COLD; BUT THIS IS NOT ADVISABLE WITH CLEAR GLASS, AS FINE DUST IS ALMOST SURE TO WORK IN BETWEEN INNER AND OUTER PANES, THE GLASS SWEATS MORE OR LESS IN COLD WEATHER, AND BETWEEEN DUST AND MOISTURE A THIN FILM GATHERS ON THE INNER SURFACES AND DESTROYS THE CLEARNESS OF THE GLASS. IF TINTED OR COLORED GLASS IS USED THE EFFECTS OF THE DUST AND MOISTURE ARE LESS APPARENT AND NOT LIKELY TO BE ANNOYING, IF GLAZING IS WELL DONE.

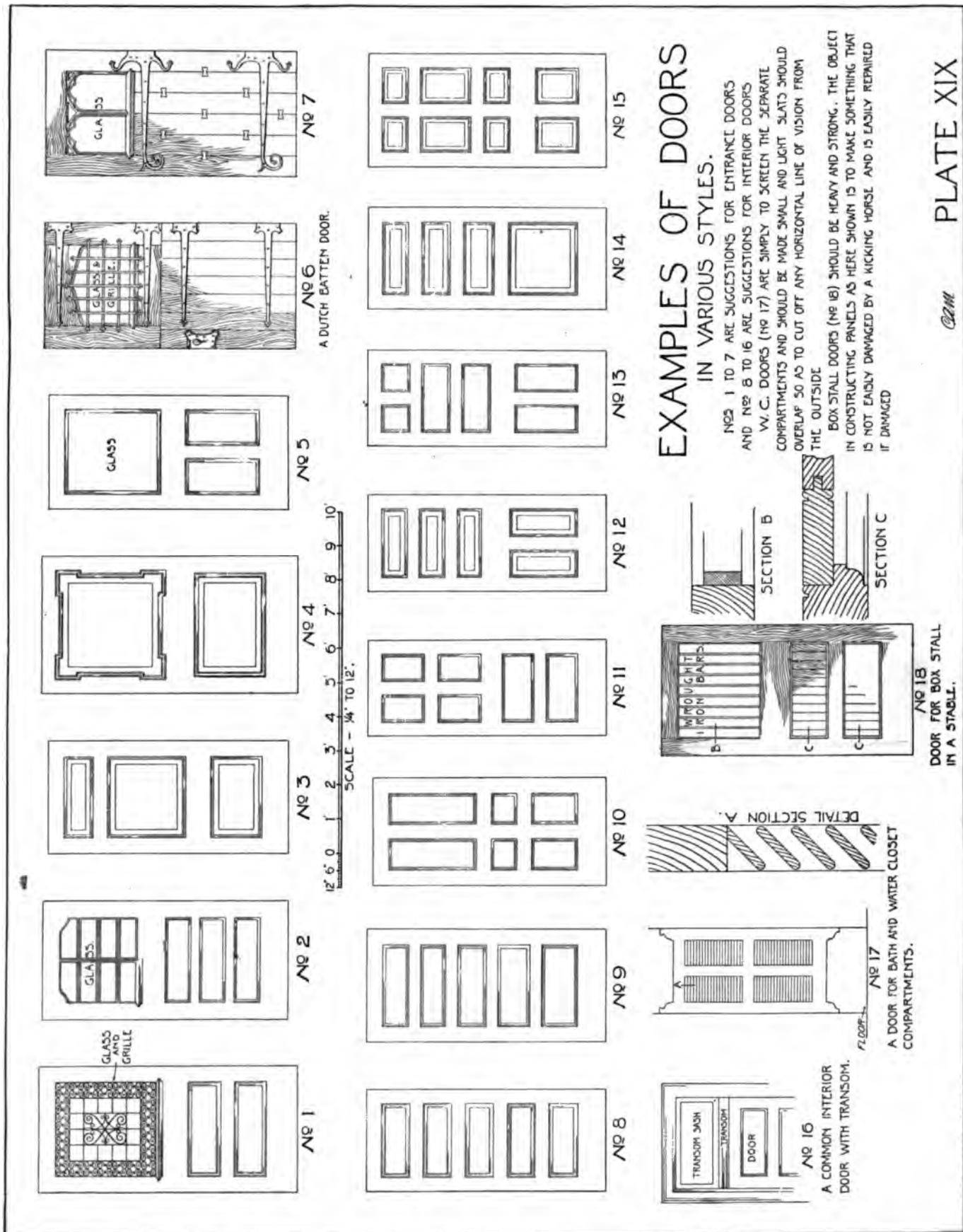


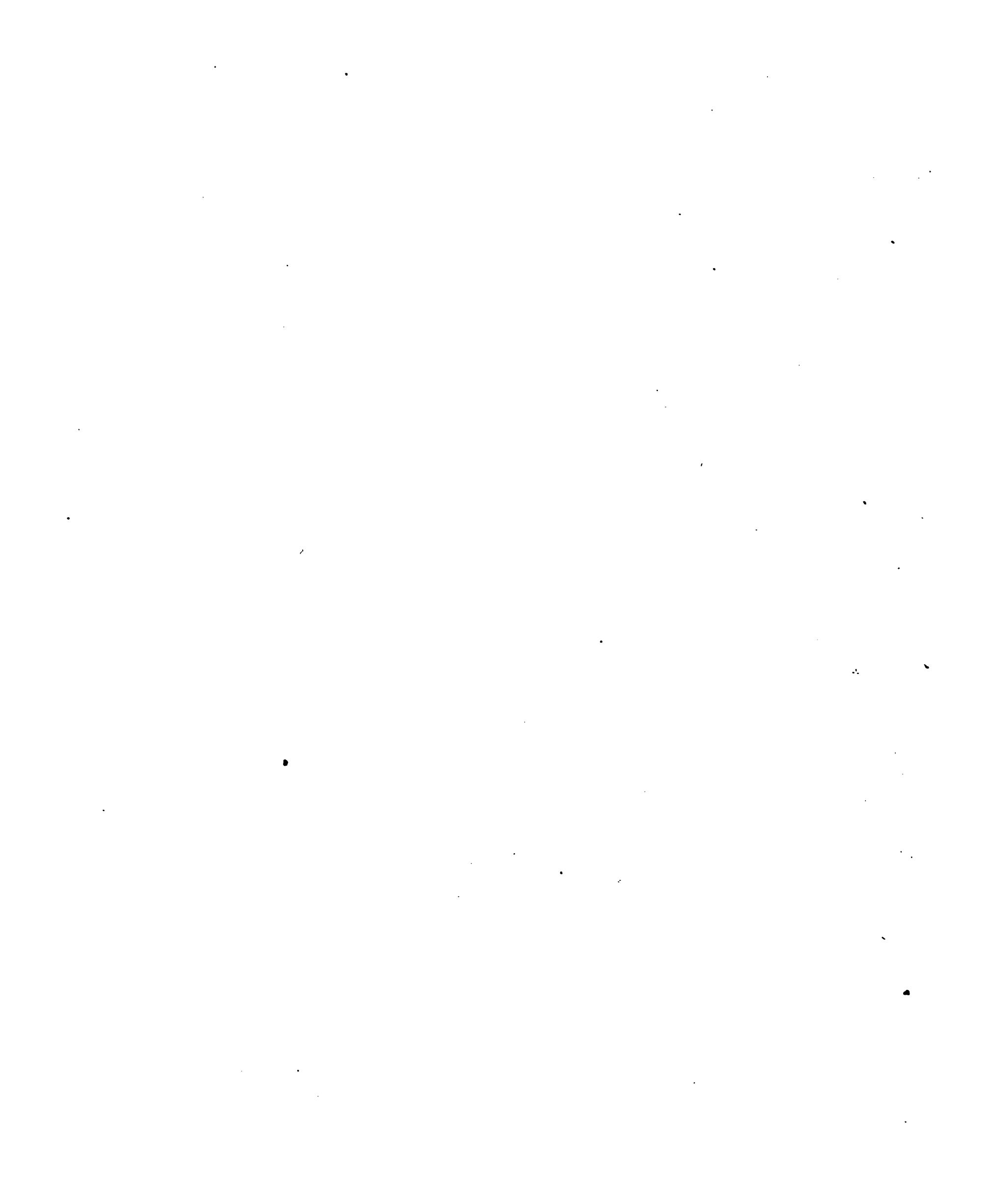
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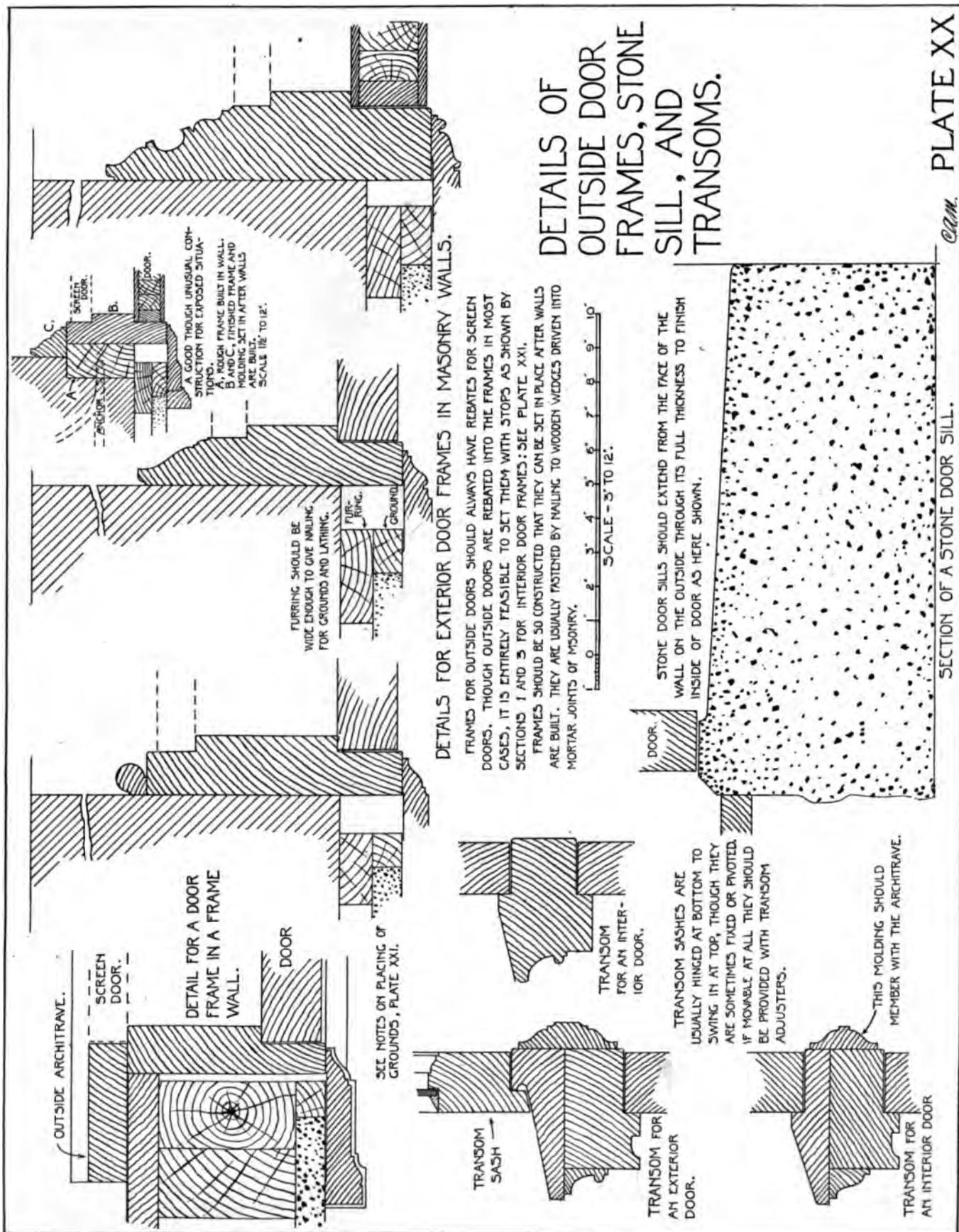


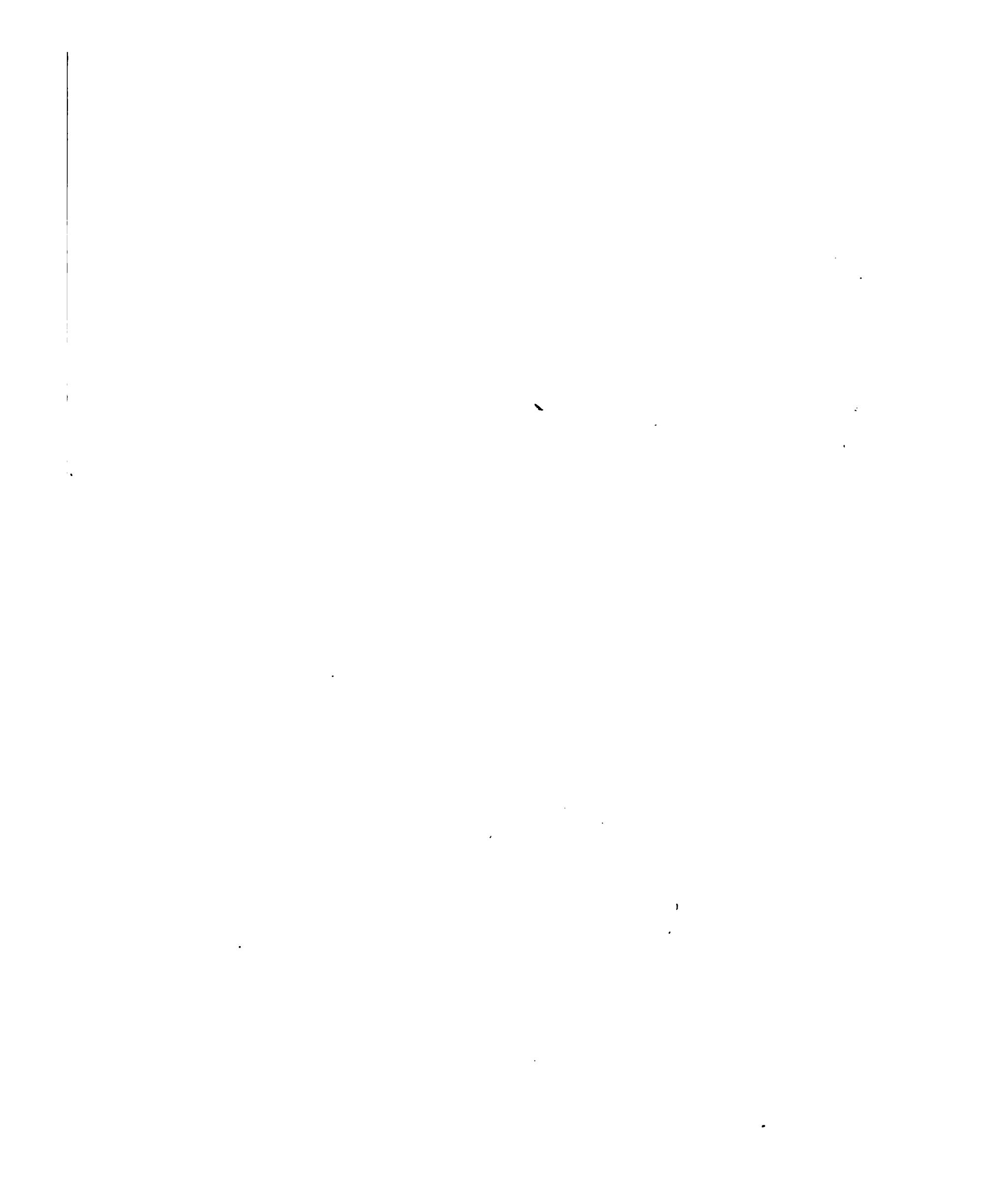


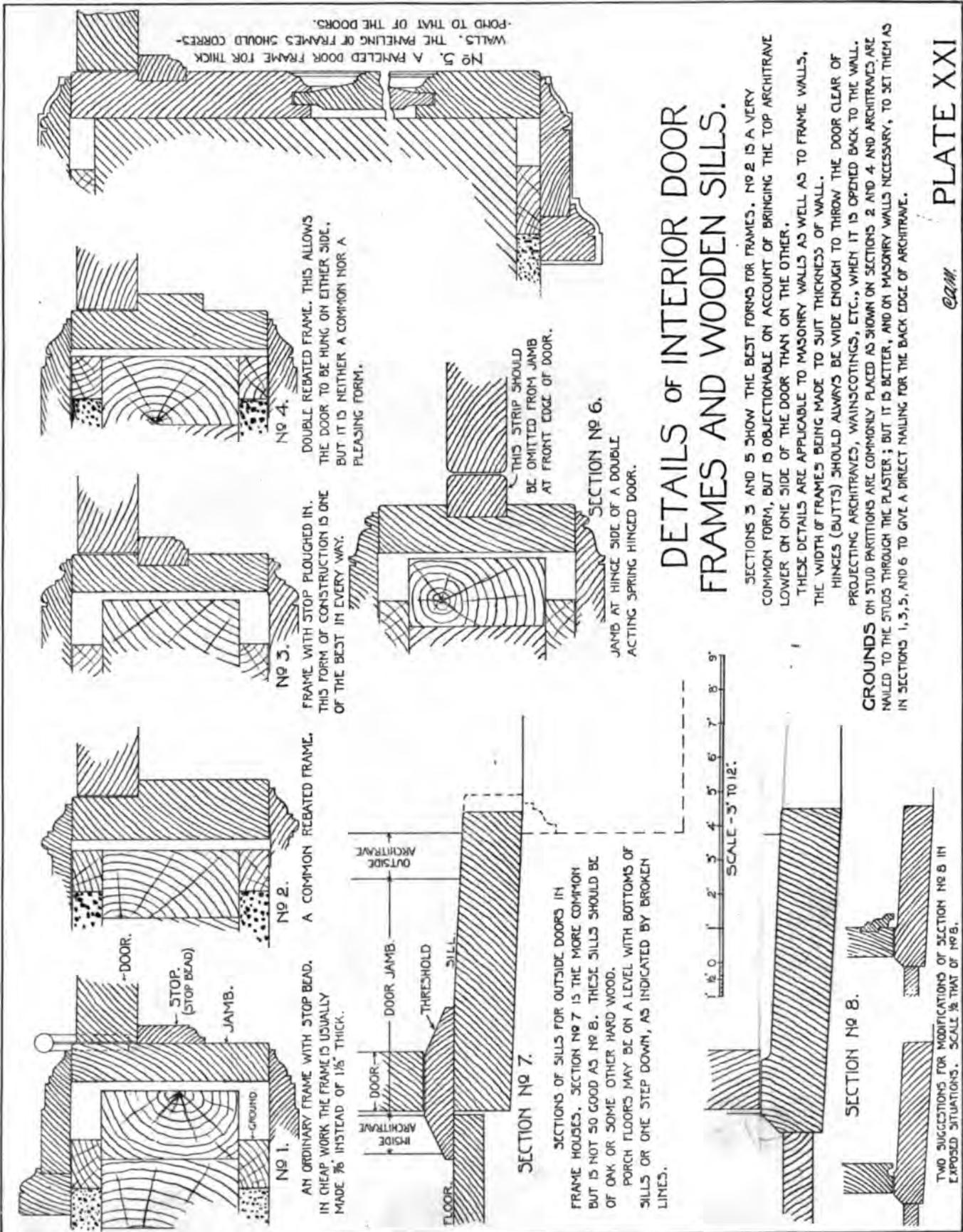




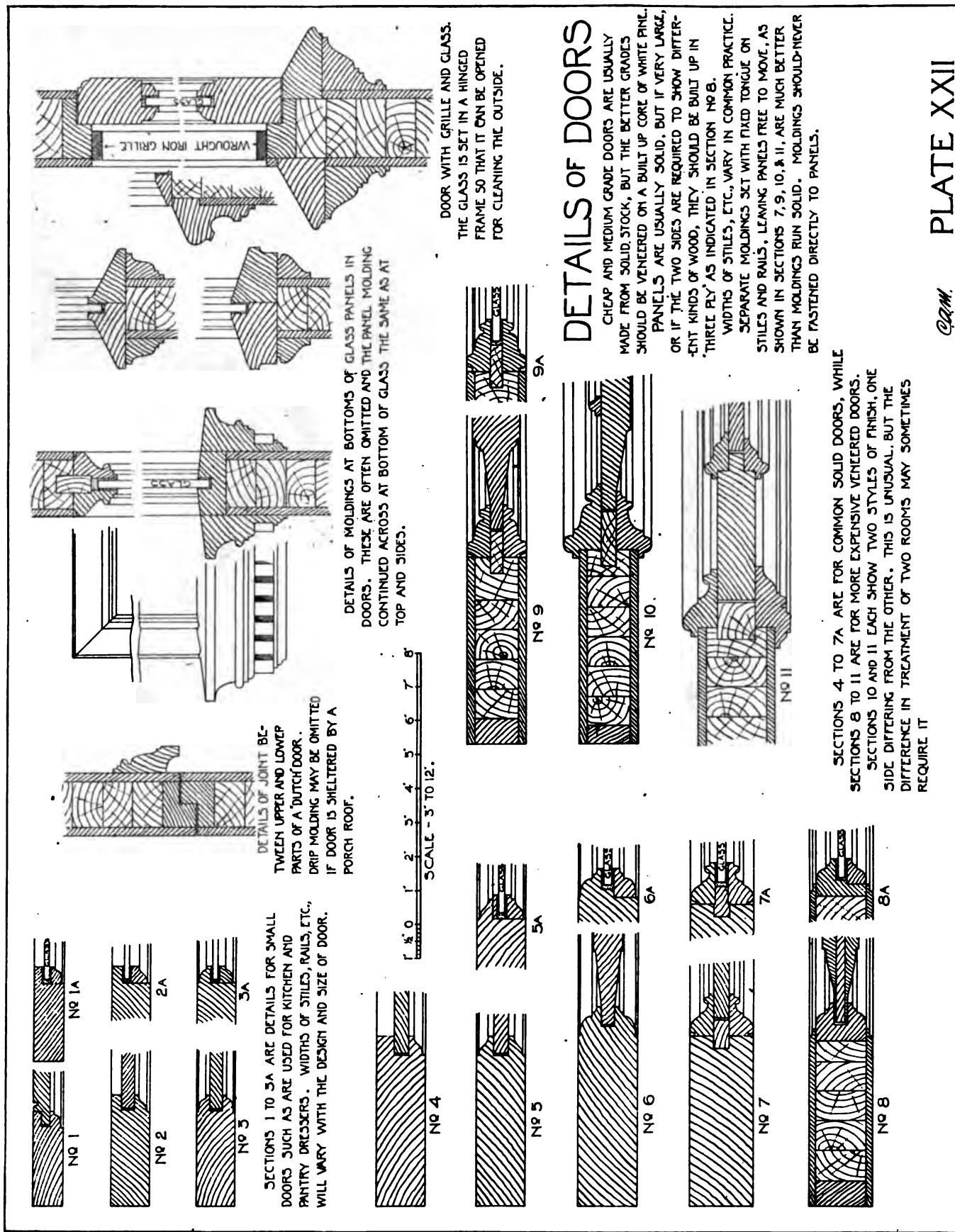




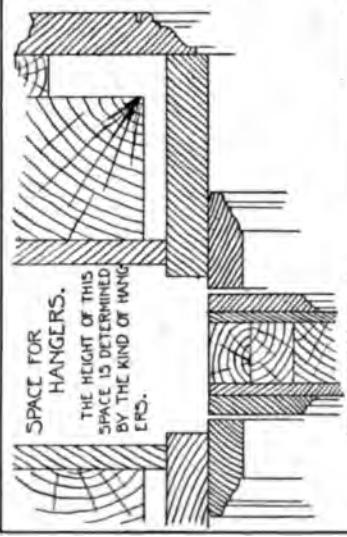








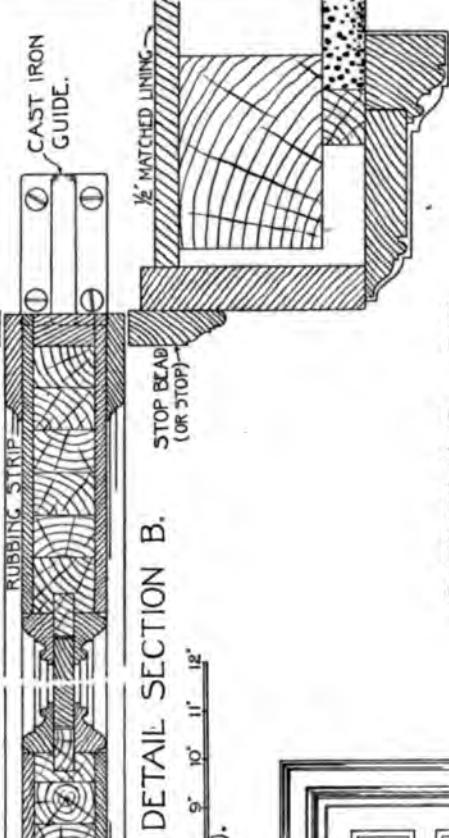
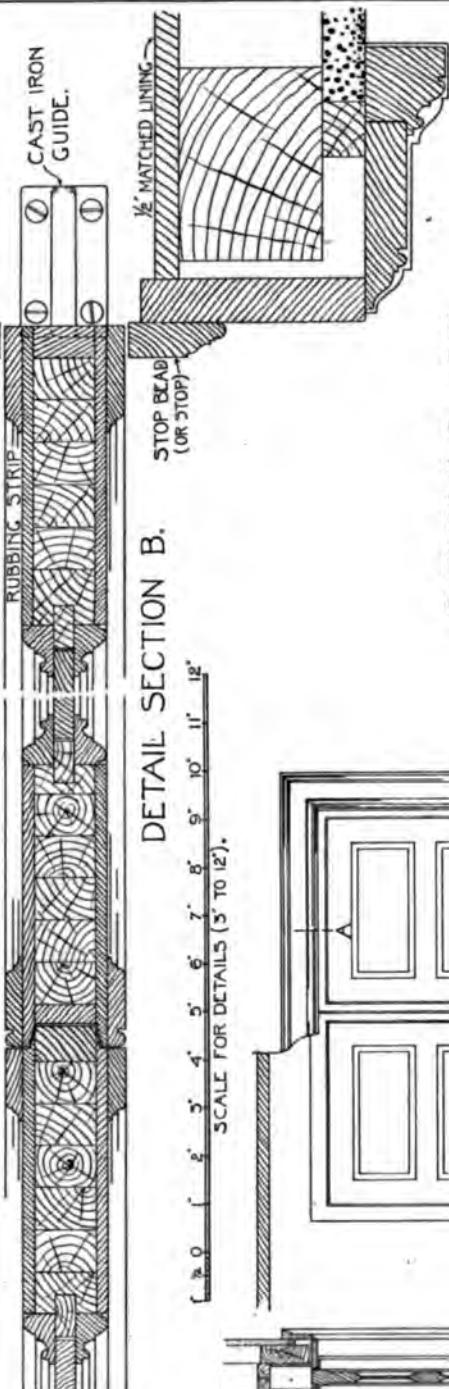




NOTES ON HANGERS.

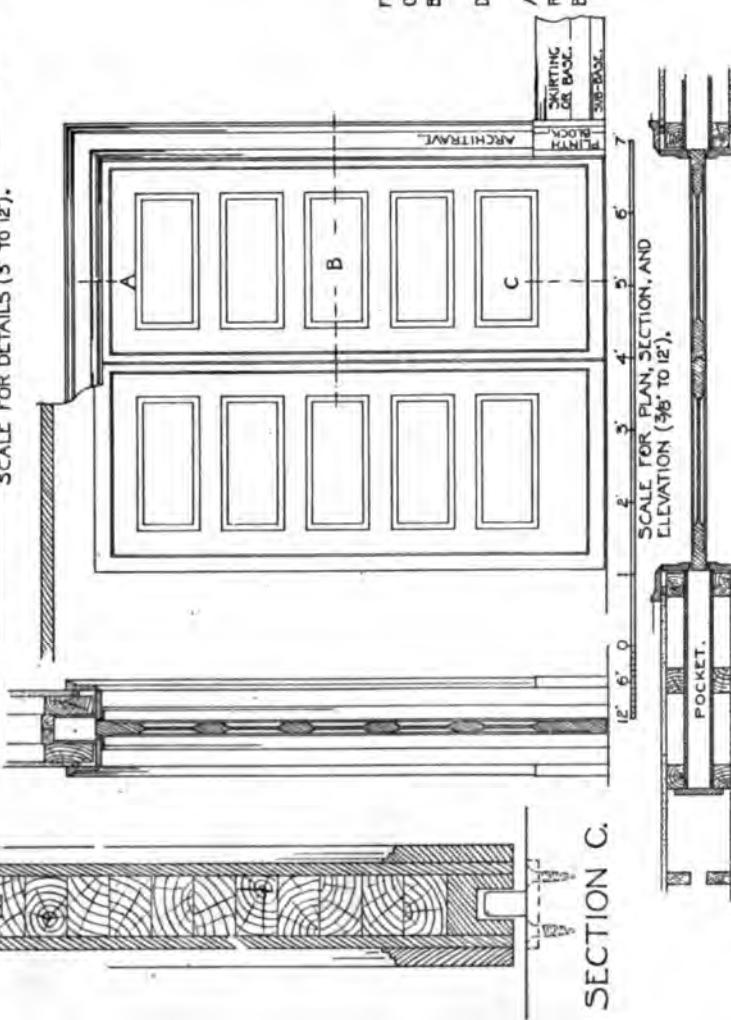
AS THERE ARE NOW A NUMBER OF EXCELLENT SLIDING DOOR HANGERS ON THE MARKET, IT SEEMED BEST NOT TO SHOW ANY PARTICULAR ONE HERE. FOR SIMPLE AND CHEAP HANGERS ORDINARY GROOVED SHEAVES RUNNING ON A SINGLE STEEL TRACK ARE GOOD, BUT FOR A GOOD GRADE OF WORK THOSE OVERHEAD HANGERS WITH ROLLER BEARING'S AND ADJUSTABLE TUBULAR TRACKS ARE RECOMMENDED. TRACKLESS HANGERS WITH LONG ARMS AND LAZY TONGS MOVEMENT ARE OFTEN USED, BUT THERE ARE USUALLY SO MANY PARTS TO GET OUT OF ORDER THAT THEY ARE Seldom AS SATISFACTORY AS THE MORE SIMPLE OVERHEAD HANGERS.

SECTION A.



DETAILS OF SLIDING DOORS.

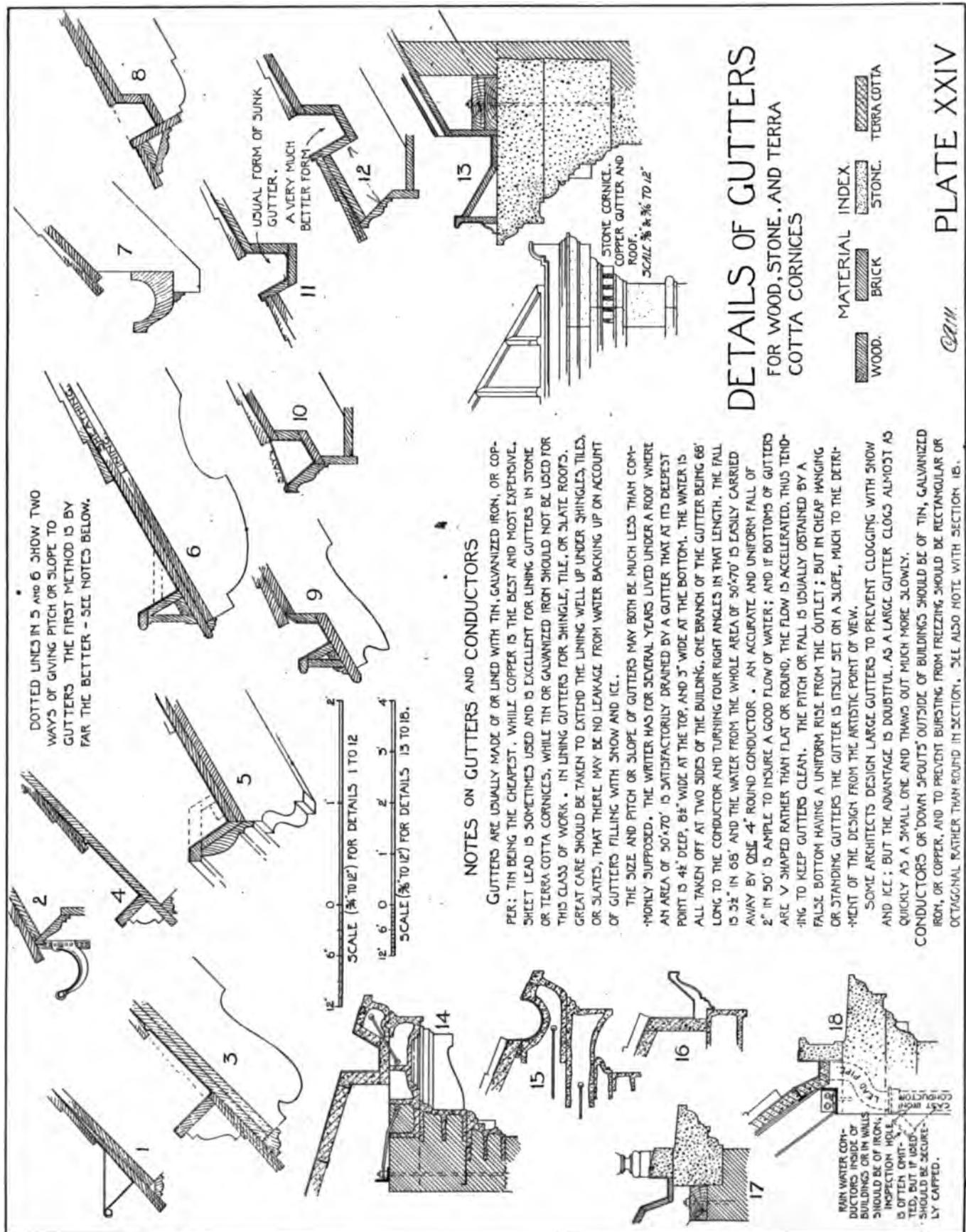
FRAME PARTITIONS FOR ORDINARY SLIDING DOORS VARY FROM 10' TO 15' IN THICKNESS, DEPENDING UPON THE THICKNESS OF THE DOORS AND SIZE OF STUDS. 2 STUDS ARE OFTEN USED, BUT 3 STUDS MAKE A MUCH STIFFER CONSTRUCTION. POCKETS SHOULD ALWAYS BE LINED AS A PROTECTION FROM DIRT CAUSED BY FALLING BITS OF PLASTER. SMALL MOULDED RUBBING STRIPS SHOULD ALWAYS BE PUT ALL AROUND THE MARGINS OF SLIDING DOORS SO THAT STILES, RAIL, AND MOLDINGS WILL WORK FREE OF STOPS AND NOT BE MARRED BY ANY SLIGHT WARPING OF DOORS.

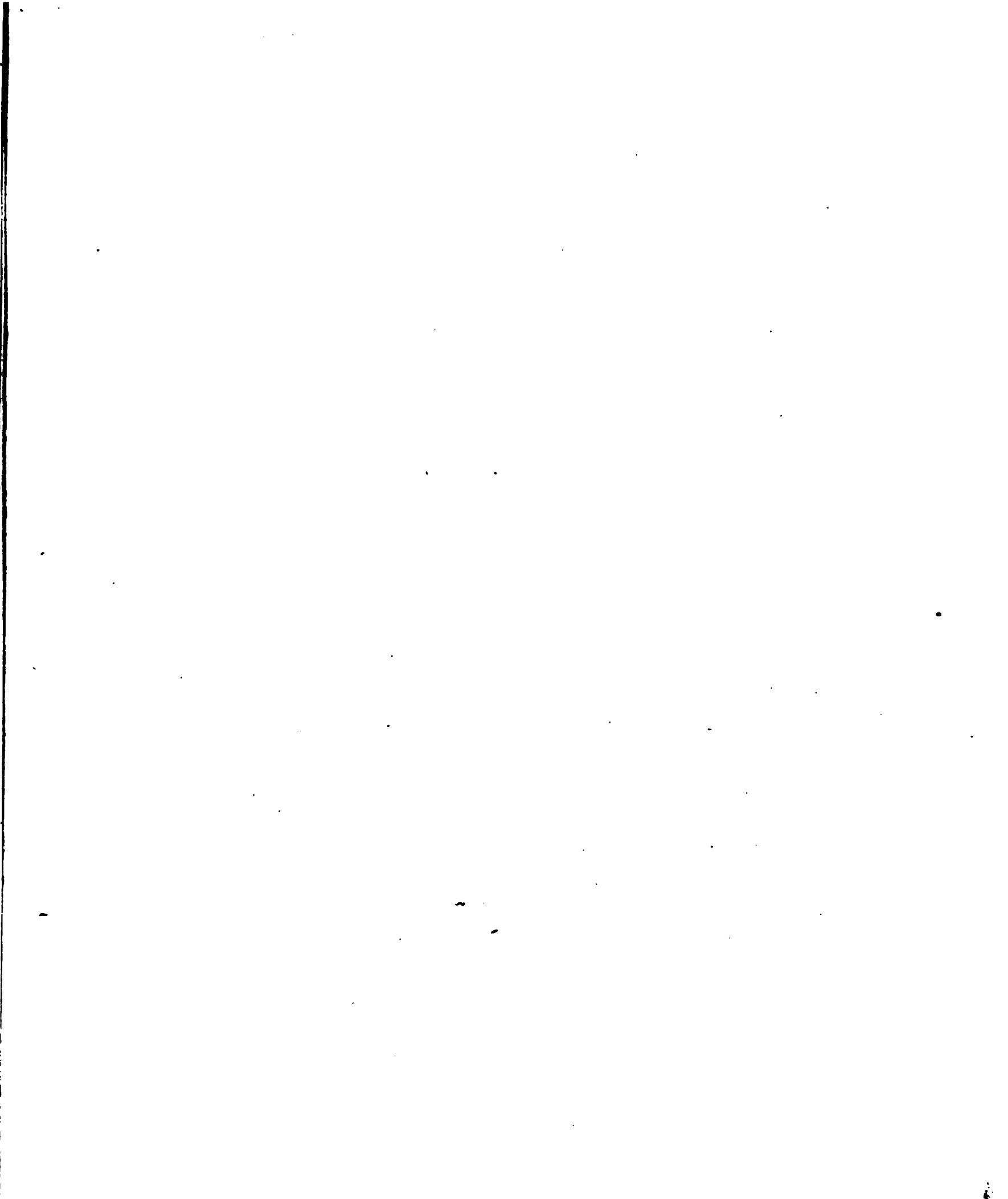


SECTION C.

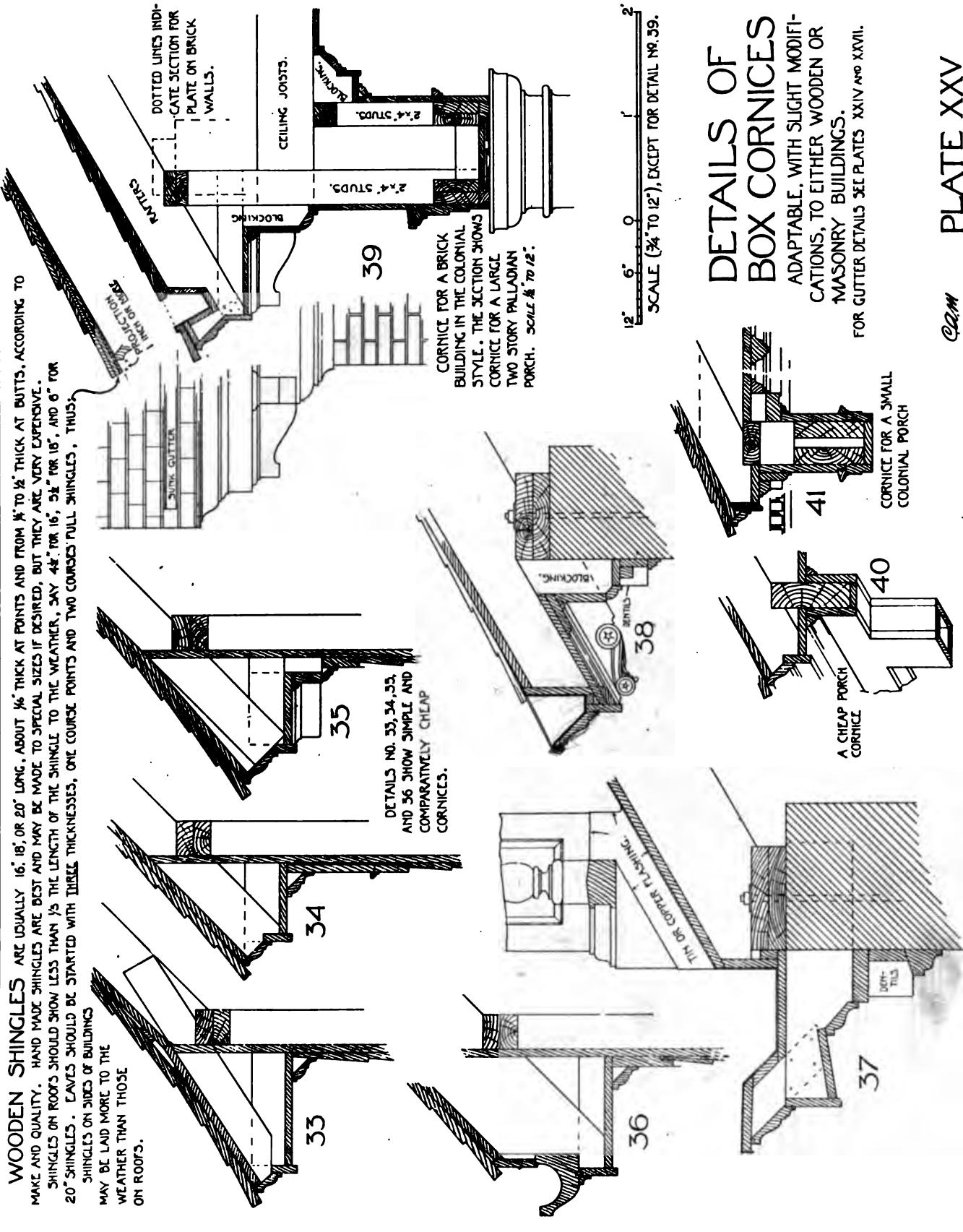
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WOODEN SHINGLES ARE IDEALLY 16' 18' OR 20' LONG, ABOUT $\frac{1}{8}$ ' THICK AT POINTS AND FROM $\frac{1}{4}$ ' TO $\frac{1}{2}$ ' THICK AT BUTTS, ACCORDING TO MAKE AND QUALITY. HAND MADE SHINGLES ARE BEST AND MAY BE MADE TO SPECIAL SIZES IF DESIRED, BUT THEY ARE VERY EXPENSIVE. SHINGLES ON ROOFS SHOULD SHOW LESS THAN $\frac{1}{8}$ ' THE LENGTH OF THE SHINGLE TO THE WEATHER, SAY 4 $\frac{1}{2}$ " FOR 16', 5 $\frac{1}{2}$ " FOR 18', AND 6" FOR 20' SHINGLES. EAVES SHOULD BE STARTED WITH THREE THICKNESSES, ONE COURSE POINTS AND TWO COURSES FULL SHINGLES, THUS SHINGLES ON SIDES OF BUILDINGS MAY BE LAID MORE TO THE WEATHER THAN THOSE ON ROOFS.



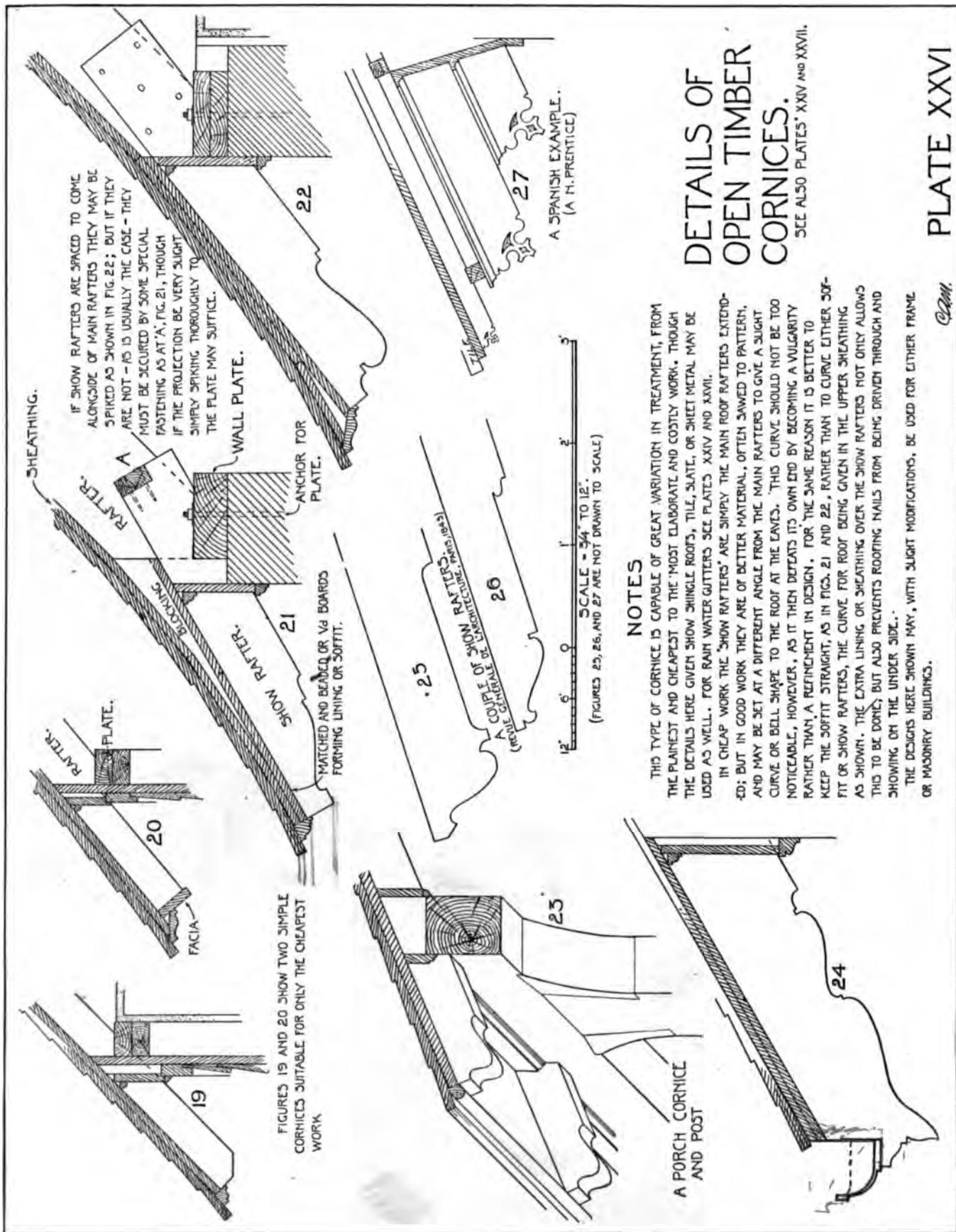
DETAILS OF BOX CORNICES

ADAPTABLE, WITH SLIGHT MODIFICATIONS, TO EITHER WOODEN OR MASONRY BUILDINGS.

FOR GUTTER DETAILS SEE PLATES XXIV AND XXVII.

CORN. PLATE XXV





DETAILS OF
OPEN TIMBER
CORNICES.

SEE ALSO PLATES XXXV AND XXXVI.

KEEP THE SOFFIT STRAIGHT, AS IN FIG. 21 AND 22, RATHER THAN TO CURVE EITHER SOFFIT OR SHOW RAFTERS, THE CURVE FOR ROOF BEING GIVEN IN THE UPPER SHEATHING AS SHOWN. THE EXTRA LINING OR SHEATHING OVER THE SHOW RAFTERS NOT ONLY ALLOWS THIS TO BE DONE, BUT ALSO PREVENTS ROOFING NAILS FROM BEING DRIVEN THROUGH AND SHOWING ON THE UNDER SIDE.

THE DESIGNS HERE SHOWN MAY, WITH SLIGHT MODIFICATIONS, BE USED FOR EITHER FRAME OR MASONRY BUILDINGS.

NOTES

THIS TYPE OF CORNICE IS CAPABLE OF GREAT VARIATION IN TREATMENT, FROM THE PLAINEST AND CHEAPEST TO THE MOST ELABORATE AND COSTLY WORK. THOUGH THE DETAILS HERE GIVEN SHOW JINGLE ROOTS, TILE, SLATE, OR SHEET METAL MAY BE USED AS WELL. FOR RAIN WATER GUTTERS SEE PLATES XXIV AND XXV.

IN CHEAP WORK THE "SHOW RAFTERS" ARE SIMPLY THE MAIN ROOF RAFTERS EXTENDED; BUT IN GOOD WORK THEY ARE OF BETTER MATERIAL, OFTEN SAWED TO PATTERN, AND MAY BE SET AT A DIFFERENT ANGLE FROM THE MAIN RAFTERS TO GIVE A SIGHT CURVE OR BELL SHAPE TO THE ROOF AT THE EAVES. THIS CURVE SHOULD NOT BE TOO NOTICEABLE, HOWEVER, AS IT THEN DEFEATS ITS OWN END BY BECOMING A VULGARITY RATHER THAN A REFINEMENT IN DESIGN. FOR THE SAME REASON IT IS BETTER TO KEEP THE SOFFIT STRAIGHT, AS IN FIGS. 21 AND 22, RATHER THAN TO CURVE EITHER THE FIT OR SHOW RAFTERS, THE CURVE FOR ROOF BEING GIVEN IN THE UPPER SHEATHING AS SHOWN. THE EXTRA LINING OR SHEATHING OVER THE SHOW RAFTERS NOT ONLY AVOIDS THIS TO BE DONE, BUT ALSO PREVENTS ROOFING HAILS FROM BEING DRIVEN THROUGH AND SHOWING ON THE UNDER SIDE.—

THE DESIGNS HERE SHOWN MAY, WITH SLIGHT MODIFICATIONS, BE USED FOR EITHER FRAME OR MASONRY BUILDINGS.

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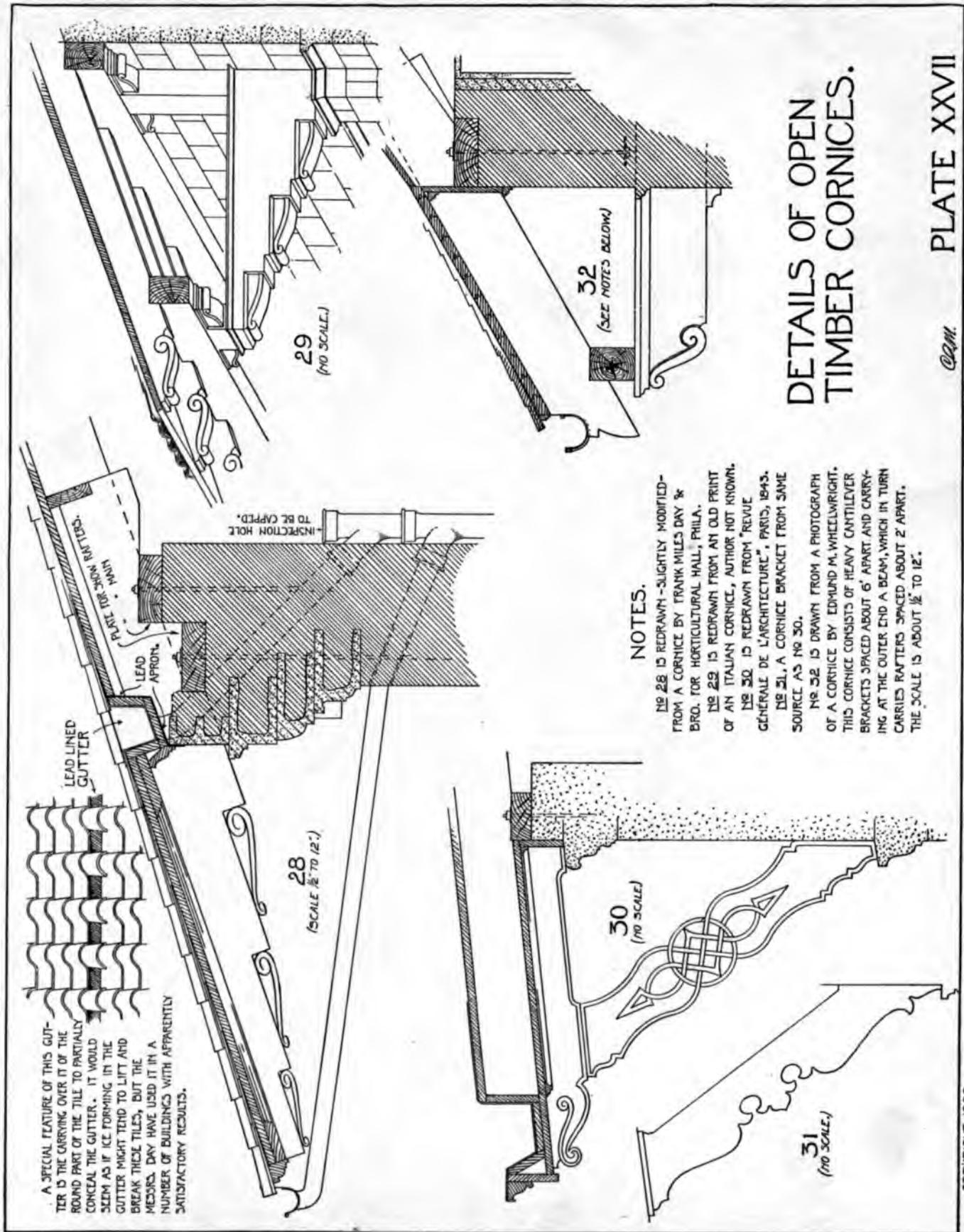
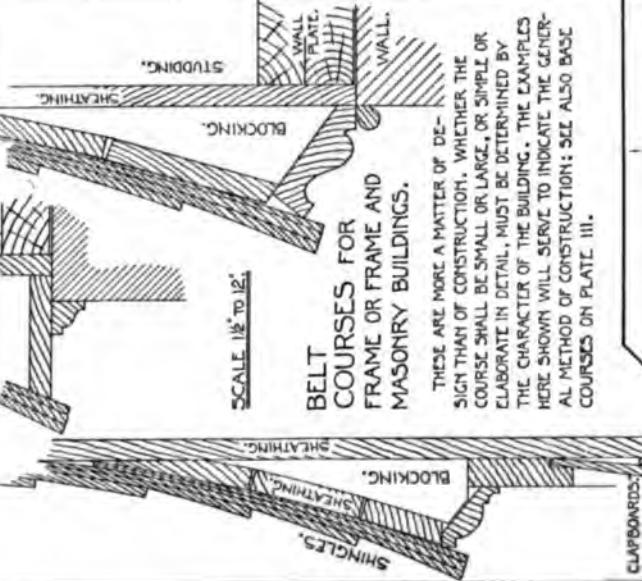
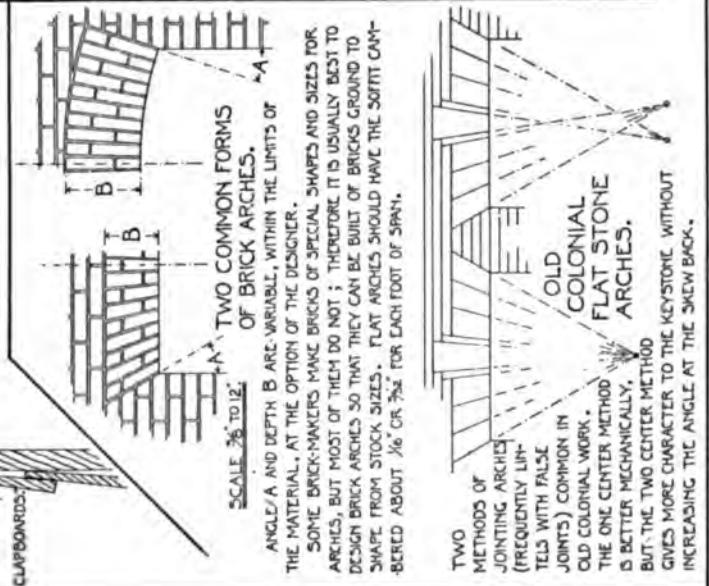


PLATE XXVII



THESE ARE MORE A MATTER OF DESIGN THAN OF CONSTRUCTION, WHETHER THE COURSE SHALL BE SMALL OR LARGE, OR SIMPLE OR ELABORATE IN DETAIL, MUST BE DETERMINED BY THE CHARACTER OF THE BUILDING. THE EXAMPLES HERE SHOWN WILL SERVE TO INDICATE THE GENERAL METHOD OF CONSTRUCTION; SEE ALSO GENERAL PLATE III.



TWO METHODS OF JOINTING ARCHES (FREQUENTLY LINED WITH FALSE JOINTS) COMMON IN OLD COLONIAL WORK. THE ONE CENTER METHOD IS BETTER MECHANICALLY, BUT THE TWO CENTER METHOD GIVES MORE CHARACTER TO THE KEYSTONE WITHOUT INCREASING THE ANGLE AT THE SKEW BACK.

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HALF TIMBER CONSTRUCTION.

Usually in Europe the timber forms the real construction, filled in and backed up with brick which is commonly plastered on the outside flush with the timber. In this country the timbers are not structural, are used for effect only, and are usually made to project from $\frac{1}{2}$ to 1' from the face of plaster.

SHAM HALF TIMBER WORK.

Timbers may be 1, 1 $\frac{1}{2}$, or 2" thick, 4 to 12" wide, and are usually left rough. Wooden lathing is sometimes used but expanded metal or woven wire is much better. "Plaster board" is good and finishes with one coat of plaster. All lathing requires furring to give clinch for plaster: wood furring for wooden lath; and wood, $\frac{1}{4}$ round iron, or small V shaped iron for metal lath. Sheathing paper before lathing. Plaster is often finished as rough cast or pebble dash.



FIG. 1.

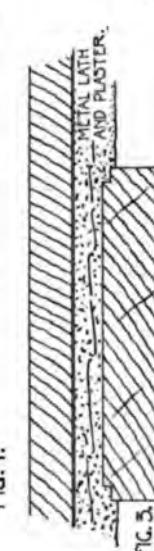


FIG. 3. AND 4 SHOW TIMBERS PUT ON OVER LATH AND FIRST COAT OF PLASTER.



FIG. 4. SHOWS TIMBERS PUT ON OVER LATH AND FIRST COAT OF PLASTER.

SHAMMING.

BUILDING PAPER.

PLASTER ON METAL LATH OR PLASTER BOARD.

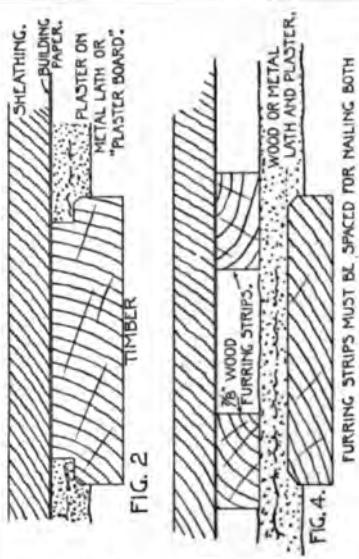


FIG. 2. TIMBER
WOOD FURRING STRIPS.
WOOD OR METAL LATH AND PLASTER.

SOLID TURNED COLUMNS.

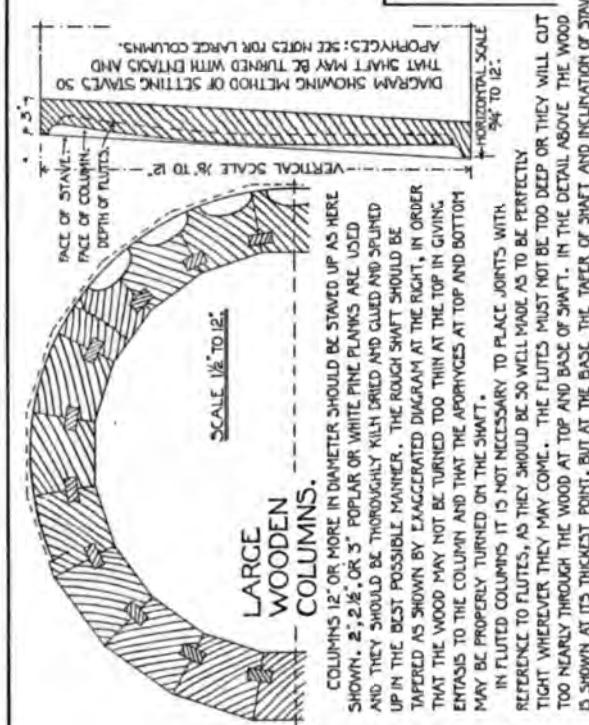
SOLID COLUMNS UNLESS VERY SMALL SHOULD ALWAYS HAVE A 2" (OR, LARGER) HOLE BORED THROUGH THE CENTER TO MINIMIZE THE TENDENCY TO CHECK. THE PRACTICAL LIMIT OF DIAMETER FOR SOLID TURNED SHAFTS IS BETWEEN 10 AND 12 INCHES, AS UNLESS CUT FROM TIMBER, ENTIRELY OUTSIDE THE HEART OF THE LOG, THEY WILL CHECK BADLY IN SPITE OF ALL PRECAUTIONS.

MISCELLANEOUS EXTERIOR DETAILS.

©ZMM.

DIAGRAM SHOWING METHOD OF SCUTTING STAVES SO THAT STAVES MAY BE TURNED WITH DRAWS AND APERTURES; SEE NOTES FOR LARGE DRAWNS AND STAVES.

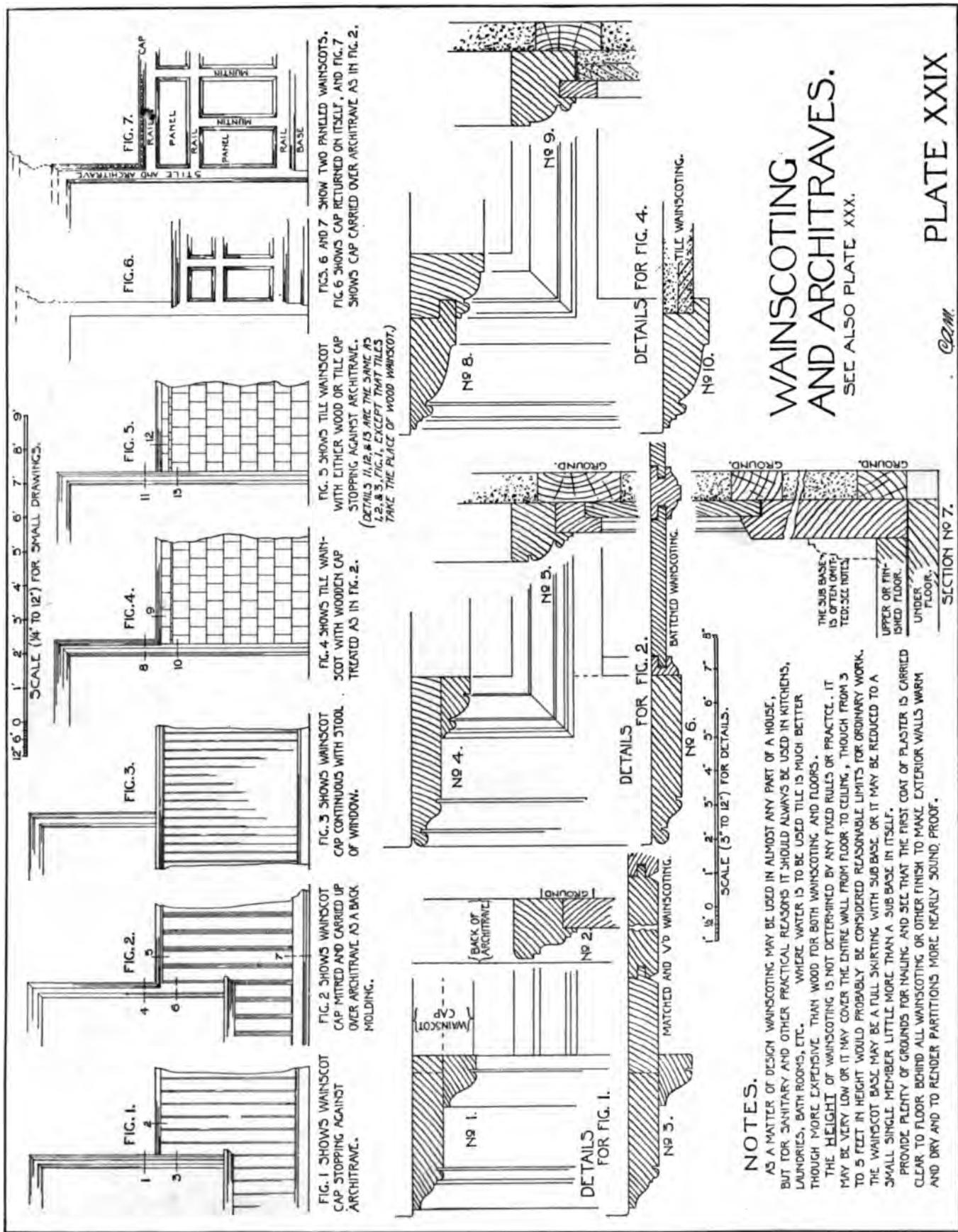
A HORIZONTAL SCALE $\frac{1}{2}$ " TO 12".



THE DETAIL ABOVE SHOWS A COLUMN 22" IN DIAMETER STAVED UP IN 20 PIECES. A 12" COLUMN WOULD REQUIRE ONLY 8 STAVES.

PLATE XXVIII





WAINSCOTING
AND ARCHITRAVES.
SEE ALSO PLATE XXX.

SEE ALSO PLATE XXX.

PLATE XXX

Can.

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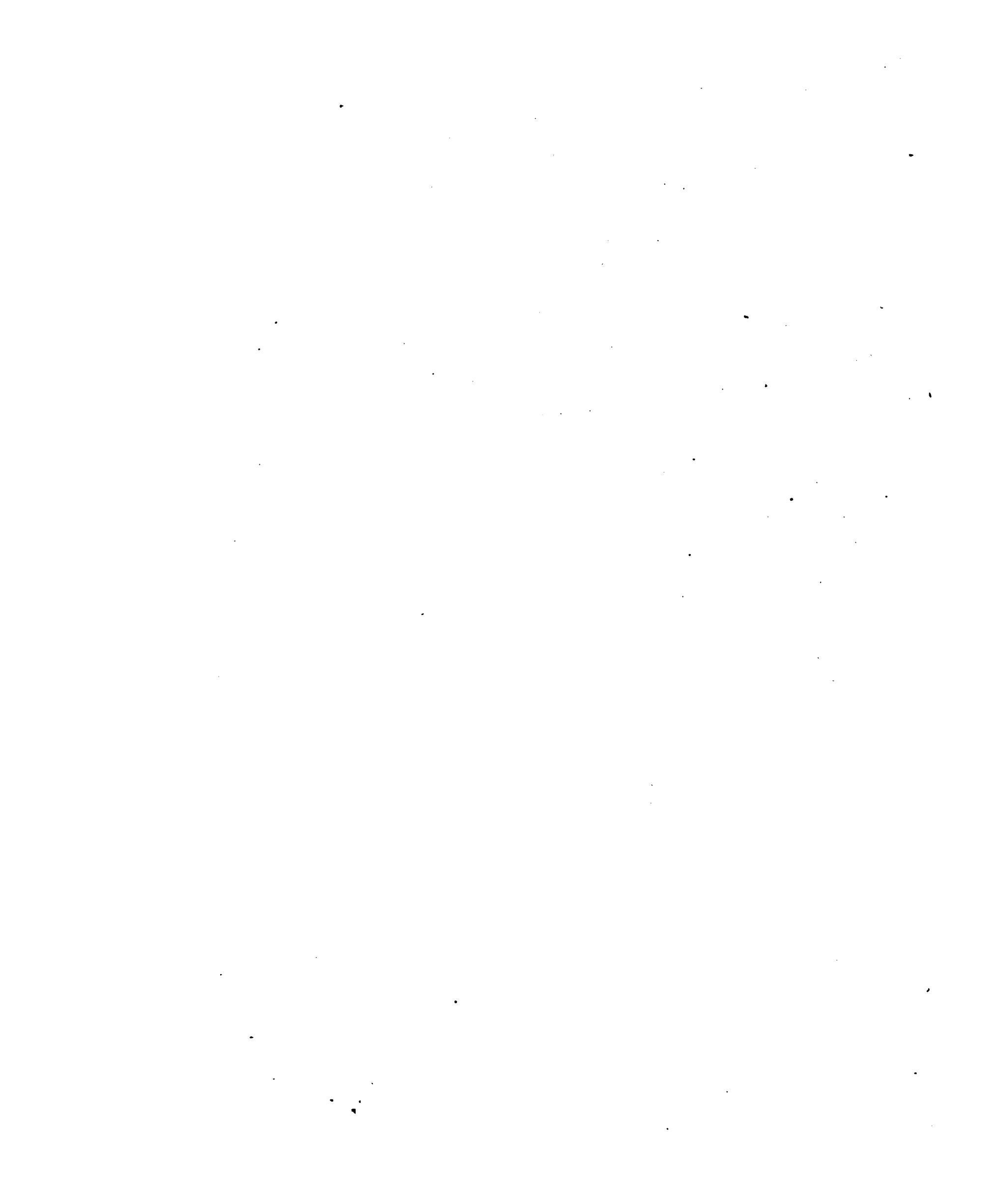
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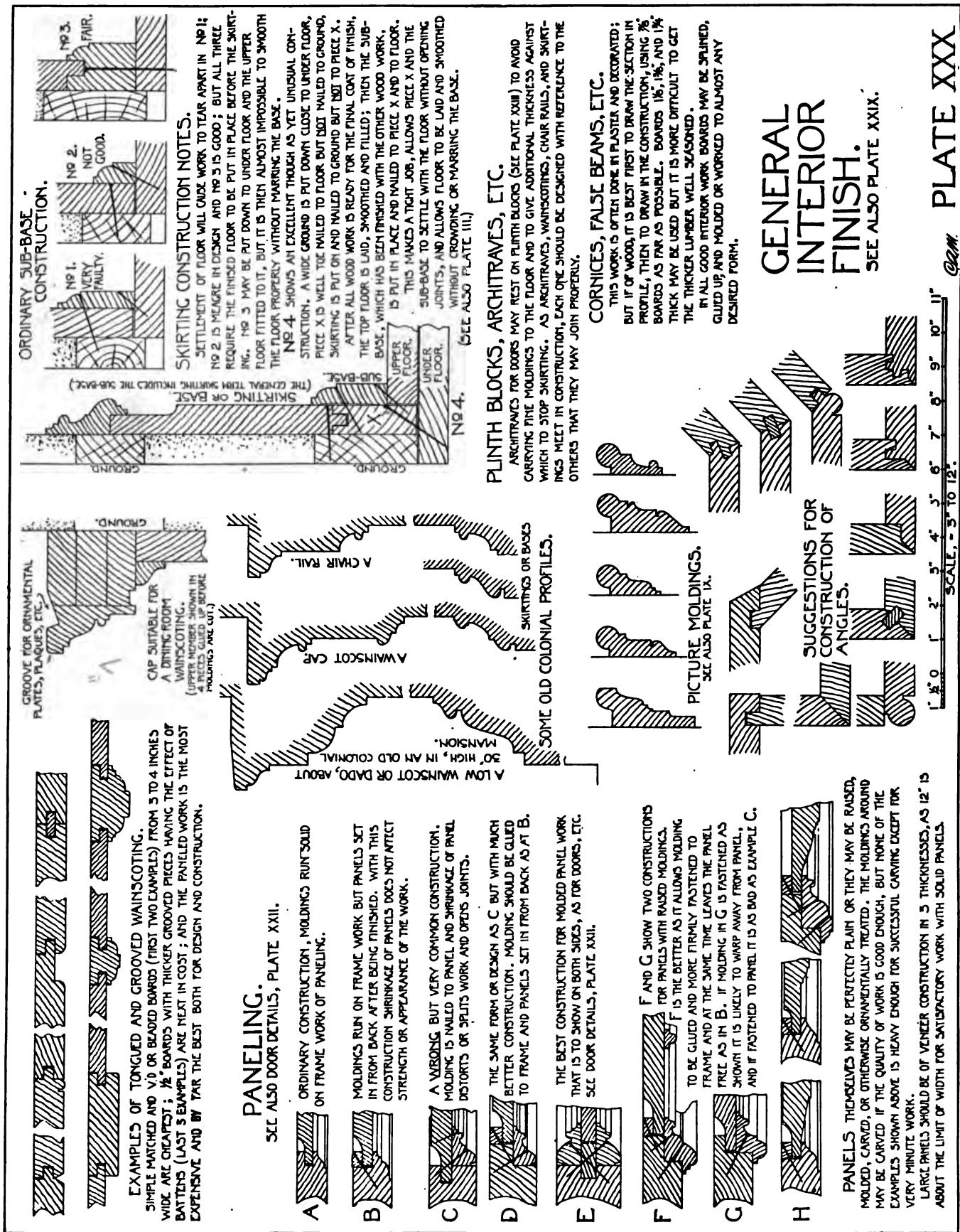
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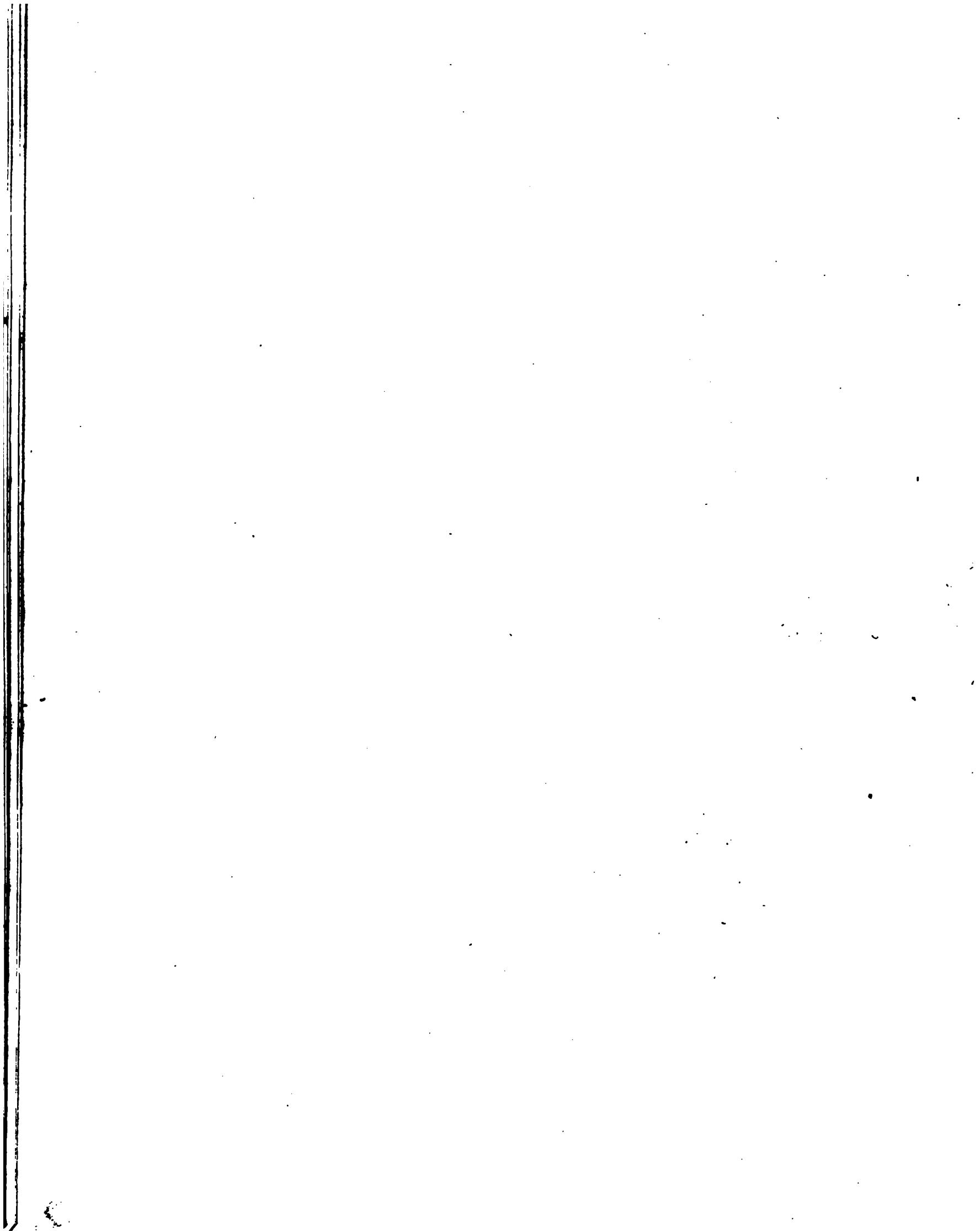
AS A MATTER OF DESIGN WAINGSCOTING MAY BE USED IN ALMOST ANY PART OF A HOUSE, BUT FOR SANITARY AND OTHER PRACTICAL REASONS IT SHOULD ALWAYS BE USED IN KITCHENS, LAUNDRIES, BATH ROOMS, ETC. WHERE WATER IS TO BE USED TILE IS MUCH BETTER THOUGH MORE EXPENSIVE THAN WOOD FOR BOTH WAINGSCOTING AND FLOORS.

THE HEIGHT OF WAINGSCOTING IS NOT DETERMINED BY ANY FIXED RULES OR PRACTICE. IT MAY BE VERY LOW OR IT MAY COVER THE ENTIRE WALL FROM FLOOR TO CEILING, THOUGH FROM 3 TO 5 FEET IN HEIGHT WOULD PROBABLY BE CONSIDERED REASONABLE LIMITS FOR ORDINARY WORK. THE WAINGSCOT BASE MAY BE A FULL SKIRTING WITH SUB BASE, OR IT MAY BE REDUCED TO A SMALL SINGLE MEMBER LITTLE MORE THAN A SUB BASE IN ITSELF.

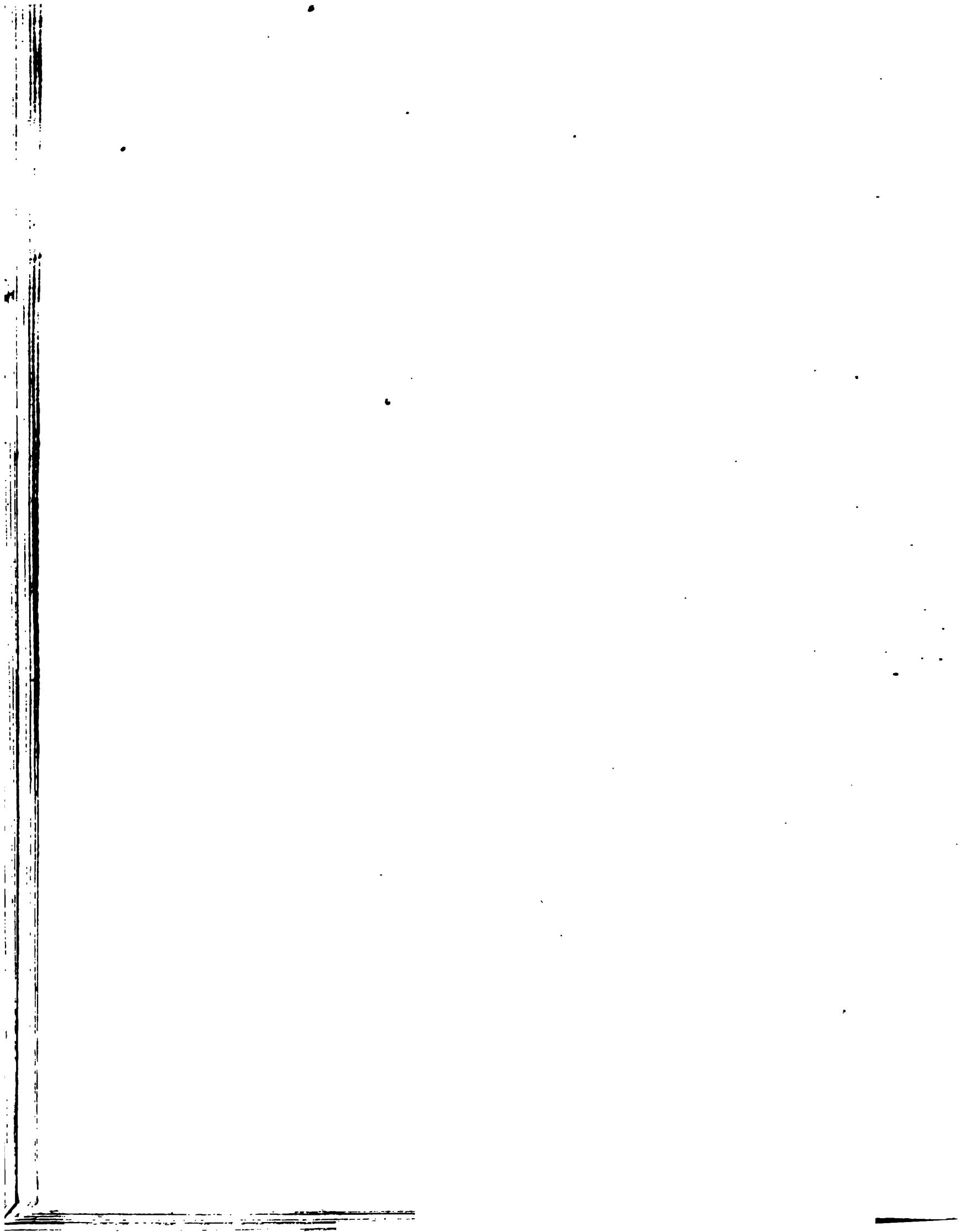
PROVIDE PLENTY OF GROUNDS FOR NAILING AND SET SO THAT THE FIRST COAT OF PLASTER IS CARRIED CLEAR TO FLOOR BEHIND ALL WAINGSCOTING OR OTHER FINISH TO MAKE EXTERIOR WALLS WARM AND DRY AND TO RENDER PARTITIONS MORE NEARLY SOUND. PROOF.











BRICK FLUES SHOULD HAVE 8 $\frac{1}{2}$ ' OF BRICK ALL AROUND OUTSIDE AND 4' WITINS BETWEEN THEM. THEY SHOULD HAVE JORTURES STRUCK SMOOTH AND, NOTWITHSTANDING MANY AUTHORITIES TO THE CONTRARY, SHOULD NOT BE PLASTERED INSIDE, AS PLASTER IS LIKELY TO PELL OFF AND CLOG OR AT LEAST ROUGHEN TLES.

TERRA COTTA FLUE LININGS REQUIRE ONLY 4" OF BRICK OUTSIDE, THEY CAN BE SET IN GROUPS WITH ONLY OCCASIONAL WIDTH TO TIE AND STRENGTHEN CHIMNEYS, AND THEY GIVE CLEAN SMOOTH FLUES OF UNIFORM SECTION THROUGHOUT. THE SAVING OF BRICK AND LABOR, TO SAY NOTHING OF ROOM, MAKES TERRA COTTA FLUES VERY LITTLE MORE EXPENSIVE THAN PROPERLY

NORMAL SIZE DIRECTLY OVER MIDDLE OF FIREPLACE; THEN, IF NECESSARY, IT MAY BE DEFLECTED BY EASY BENDS TO ONE SIDE OR THE OTHER, IF GATHERED DIRECTLY TO ONE SIDE FROM THE THROAT, THE DRAFT IN THROAT WOULD BE STRONGEST ON SIDE NEAREST FLUE, AND THE FIREPLACE WOULD BE LIKELY TO SMOKE AT THE OTHER SIDE.

THE CHIMNEY BREAST IS OFTEN CARRIED UP STRAIGHT IN BRICK, ESPECIALLY IF THERE IS A FIREPLACE ABOVE; OR IT MAY BE SET BACK FROM FACE OF FIREPLACE TO SAVE SPACE AND MATERIAL AND GIVE A WIDER TOP TO MANTLE SHELF; OR IT MAY BE SET BACK AND TURNED OUT FLUSH AS HERE SHOWN. THERE IS NO FIXED RULE GOVERNING THIS IN PRACTICE.

PLAN, ELEVATION, AND SECTION OF AN ORDINARY FIREPLACE.
PLAN AND ELEVATION SHOW TWO METHODS OF FINISHING, ONE EACH SIDE OF CENTER LINE.

THE CHIMNEY BREAST IS OFTEN
CARVED UP STRAIGHT IN BRICK, ESPECIALLY
IF THERE IS A FIREPLACE ABOVE; OR
IT MAY BE SET BACK FROM FACE OF
FIREPLACE, TO GIVE SPACE AND MATERIAL
AND ONE A WIDER TOP TO MANTLE SHELF;
OR IT MAY BE SET BACK AND Poured
OUT FLUSH AS HERE SHOWN. THERE
IS NO RULE GOVERNING THIS
IN PRACTICE.

TWO HALF PLANS SHOWING FINISHED AND FLUES FOR FIREPLACES. WITH A GREAT MANY FIREPLACES IN A SINGLE STACK, IT OFTEN REQUIRES CONSIDERABLE INGENUITY TO ARRANGE FLUES SO THAT THEY WORK OUT PROPERLY THROUGHOUT THE ENTIRE HEIGHT. SEE NOTES ON BRICK AND TERRA COTTA FLUES ABOVE.

FIREPLACE DETAILS.

GENERAL NOTES.

A PROPERLY CONSTRUCTED FIREPLACE SHOULD GIVE OFF INTO THE ROOM A MAXIMUM AMOUNT OF HEAT FOR THE FUEL CONSUMED AND SHOULD NOT SMOKE. IT IS EASY TO ACCOMPLISH OTHER OBJECT IF THE OTHER BE NEGLECTED, BUT TO ACCOMPLISH BOTH REQUIRES THE UTMOST ATTENTION TO DETAILS OF FORM AND CONSTRUCTION.

SODA ACID, JASPER, ARKANSAS.
MANUFACTURED BY THE
INDUSTRIAL CHEMICAL COMPANY

JAMB SET AT RIGHT ANGLES TO BACK; BUT THE CONSTRUCTION OF FLUE AND THROTTING IS RESPONSIBLE FOR MOST OF THE GOOD OR EVIL IN A FIREPLACE. CHIMNEY'S SHOULD BE CARRIED WELL ABOVE THE HIGHEST LINE OF NEARBY ROOFS AND EACH FIREPLACE SHOULD HAVE A SEPARATE FLUE. EXPERIENCE SEEKS TO INDICATE THAT THE CLEAR SECTIONAL AREA OF THE FLUE SHOULD BE ABOUT ONE QUARTER OF THE FULL WIDTH OF OPENING. AS FAR AS I CAN TELL, FLUE LINERS ARE USELESS.

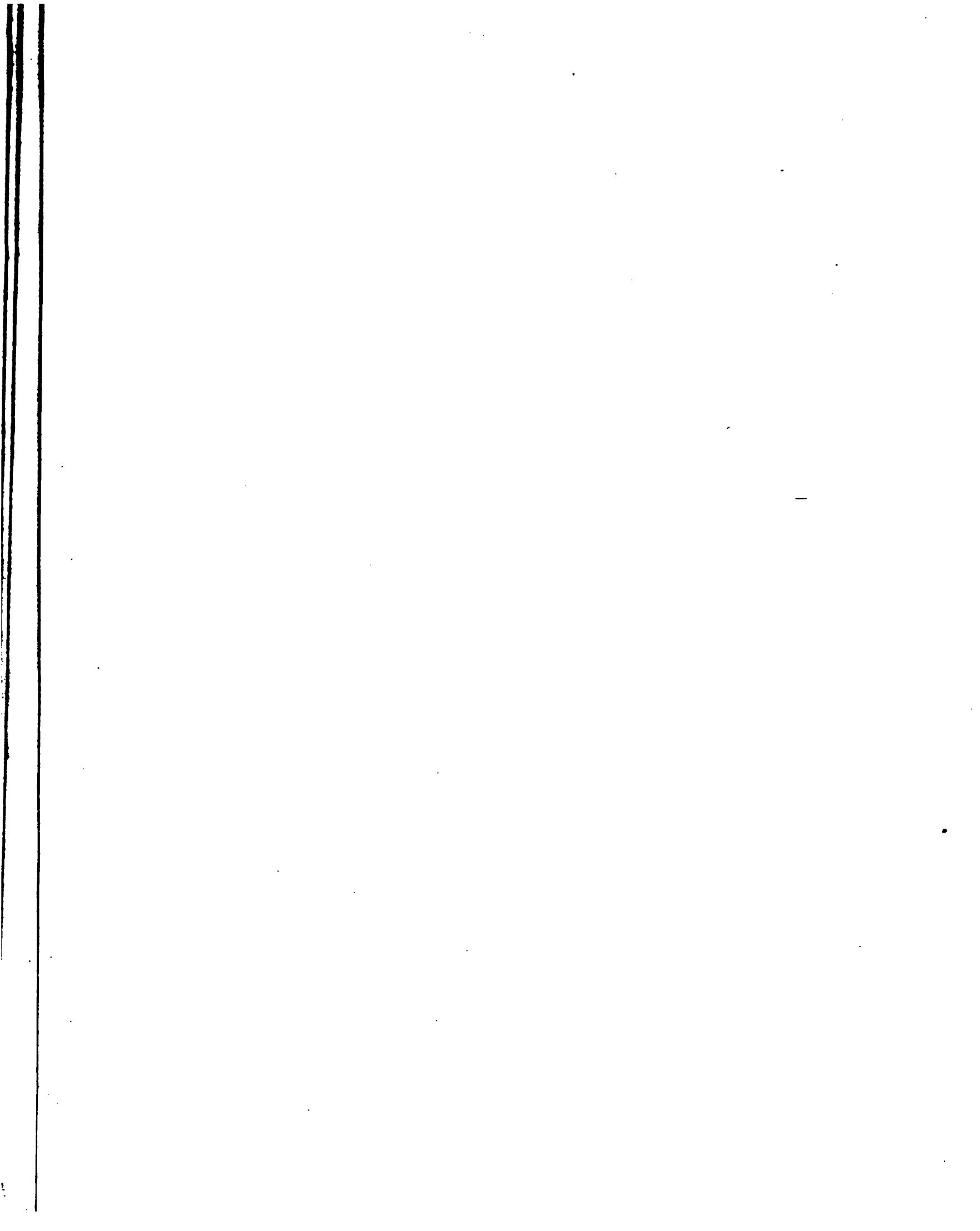
AND ITS SECTIONAL AREA, AS SHOWN IN THE FIGURE, ARE NOT USED, DAMPERS AS OR A LITTLE LESS THAN THAT OF THE FLUE. DAMPERS SHOULD OPEN THE WIDTH OF THROAT AND DRAFT, BUT THEY SHOULD OPEN THE SECTIONAL AREA OR HIGH FIRESIDE, COUNTERBALANCED "BLOWERS" OR VENTILATORS (SUSPENDED ORGANICALLY) ARE SOMETIMES HUNG BACKWARD OF FACING OR AT FRONT OF THROAT. THE BACK OF FROM 2' 6" TO 4' WIDE, 16" TO 22" DEEP, AND ABOUT 2' 6" DEEP, WILL BE PROVIDED TO CARRY ASHES TO PIT IN CELLAR.

DI ATTIVITÀ

PLATE XXXII

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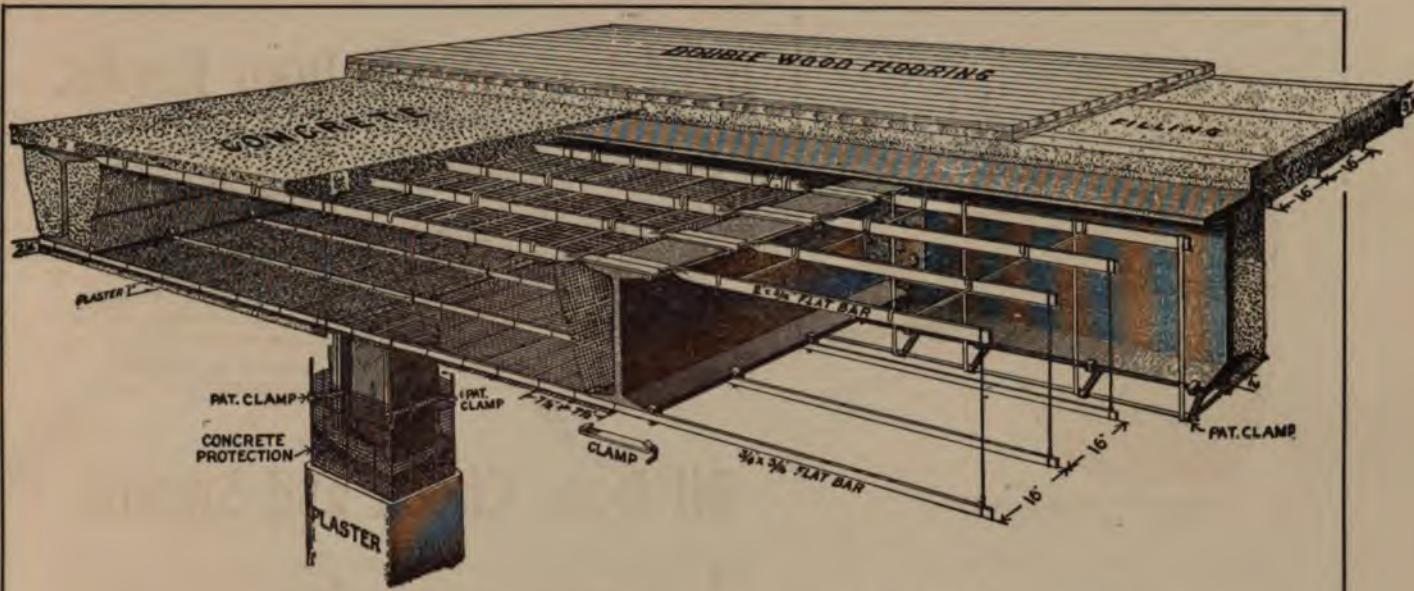
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ADVERTISEMENTS.

The few pages of advertising here given have been added to the work not so much for the sake of the revenue derived therefrom as with the hope that they may contribute to the actual value of the subject-matter by calling attention to special devices or details that could not well be included within the body of the book.





In the fire and water tests conducted by the New York City Building and Fire Departments in 1896-97, the highest efficiency was developed by

The Roebling System of Fire-Proof Construction.

The concrete used in this construction resisted the repeated application of heat and cold water better than any other material tested.

Arch System of Construction.

The Roebling system of fire-proofing is approved and used by the United States government, is endorsed by eminent engineers, and is specified by all the leading architects.

Among the prominent buildings in which this system of fire-proofing has been used is the "Bowling Green" building, Nos. 5 to 11 Broadway, New York City. This is the largest fire-proof office building in the world, and contains the Roebling fire-proof floors, partitions, furring, and wire lathing throughout.

Flat or Steel.—Concrete System.

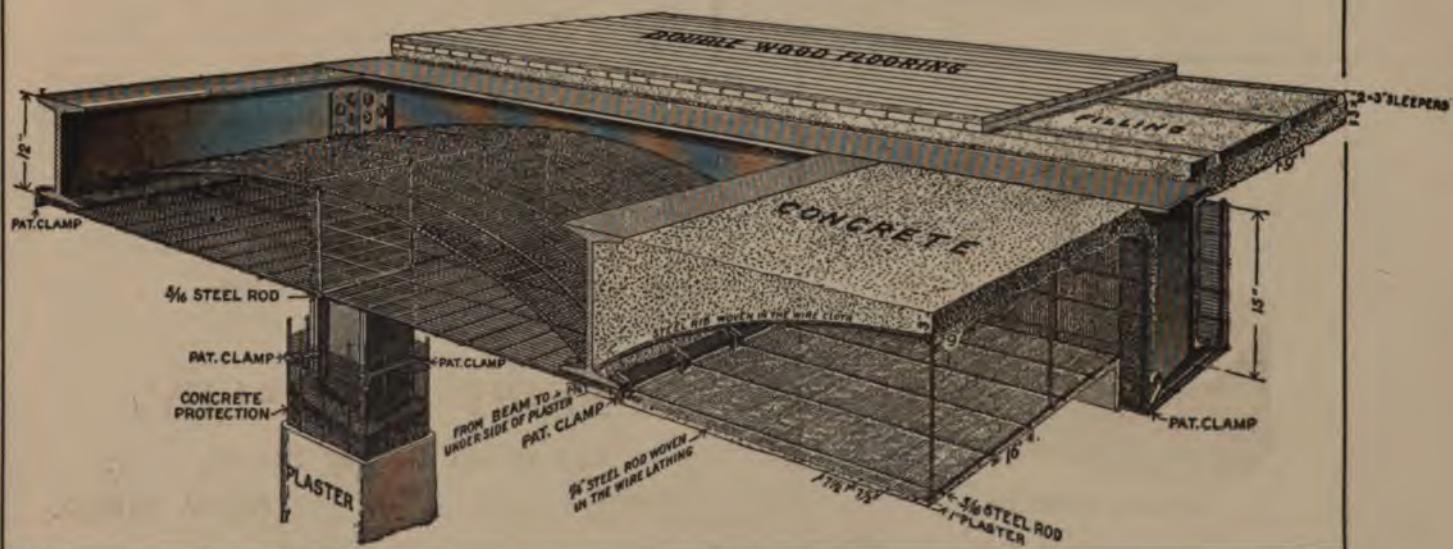
Speed of erection, absence of wood centering, the safety afforded the workmen by the wire centering, ceilings that will not crack or discolor the plaster work, lightness and economy, are distinctive features of this system.

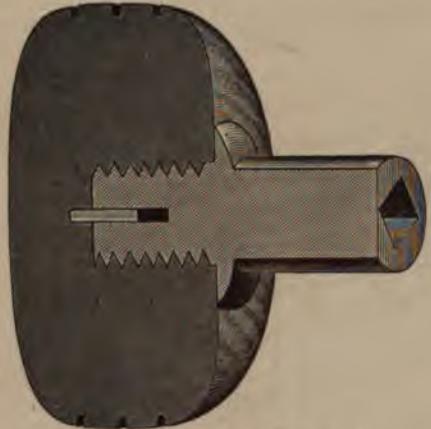
The Roebling Fire-Proof Floors Secure the Lowest Insurance Rates.

Special facilities for erecting, furring, and wire lathing for ornamental plaster effects.

Estimates furnished and contracts made for fire-proofing work of all kinds. Send for new 1898, 72-page, illustrated circular.

THE ROEBLING CONSTRUCTION COMPANY,
121 Liberty Street, New York City.

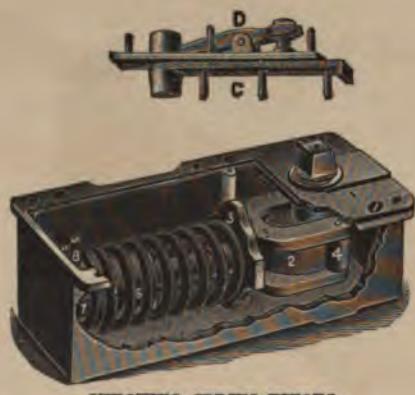




BARDLEY'S WOOD DOOR KNOBS.



OIL DOOR CHECK AND SPRING.



CHECKING SPRING HINGES.

Bardsley's Wood Door Knobs.

THese are carefully made of selected thoroughly dried material. Their beautiful and durable finish, attractive appearance, and pleasant feeling to the hand make them the most desirable knobs for dwellings. They can be matched with any interior finish, as they are made in all the woods used for that purpose.

This illustration shows our patented method of fastening the shank to the head of the knob. Before inserting the shank the flat metal key is down to the end of the slot and even with the end of the shank. After the shank has been screwed into its place the key is forced partly into the wood and locks the shank. Every knob is warranted not to get loose or give out in any way.

These Knobs are made in two grades. The higher grade has the name "BARDLEY" stamped on every shank. The genuine goods can thus be told.



Oil Door Check and Spring.

THIS device, in its improved form, embodies some new and valuable features suggested by the experience of several years in manufacturing this class of goods. Among these may be mentioned the following:—

Freedom from Packing Friction.

The Spring Cannot be Used the Wrong Way Up, and thus get bent out of shape and perhaps broken, a frequent occurrence heretofore.

A Lighter, Longer, and More Elastic Spring is Used, giving greater durability.

The Checking Power Cannot be Lost through the liquid being forced from the liquid chamber into the spring chamber, as the two are connected by openings.

A Reserve Oil Chamber is provided between the spring chamber and checking cylinder, holding a supply of oil sufficient to last many years.

More Oil can be Added when needed without removing the Check from the door.

It has a Releasing Device, by means of which the checking power is removed when the door is nearly closed, the spring thus exerting its full force to latch the door.

It may be Readily Taken Entirely Apart.



Checking Spring Hinges.

FOR SWING DOORS

THESE Double Acting Spring Hinges are especially adapted to Banks, Churches, Public Buildings, Butler's Pantrys, and all doors where automatic closing, combined with gentle, silent action, is desirable. Many thousands are now in use. The mechanism is entirely of metal, very strong, simple, and durable, contained in a closed iron casing covered with a brass plate let into the floor or sill, under the door. The casing is nearly filled with a specially prepared non-freezing oil, which serves as a checking medium as well as lubricant.

These hinges possess the following advantages:—

They do not swing the door violently, but close it gently and without noise, and stop it at once at the centre.

There are no unsightly projections on the door or frame.

The springs are not twisted, but compressed, and do not break or set.

The door cannot sag, being hung on pivots.

The greatest pressure of the spring is at the closing point.



JOSEPH BARDLEY,

147 to 151 Baxter Street,

NEW YORK.

*Send for Illustrated
Descriptive Catalogue.*



PRISCILLA.— Colonial.



BRAMANTE.— Italian Renaissance.



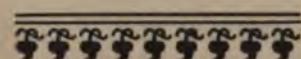
DIJON.— Gothic.

Russell & Erwin Manufacturing Company

Fine Builders' Hardware

In Harmony with All Prominent Styles of Architecture

COLUMBIA AND
RUSSWIN CYLINDER LOCKS,
WROUGHT STEEL LOCKS,
DOOR CHECKS,
DOOR HOLDERS,
STEEL SQUARES,
WOOD SCREWS,
MACHINE SCREWS.



NEW BRITAIN, CONN.
NEW YORK,
PHILADELPHIA,
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The Norris Patent Sash Pulley.

TRADE MARK
REGISTERED



WRITE FOR SAMPLE OF OUR NEW BALL
BEARING ANTI-FRICTION PULLEYS, THE
BEST ANTI-FRICTION MADE.



ORRIS PULLEYS are the leading Sash Pulleys of the Country. They are used in the majority of the principal Buildings throughout the entire country. The majority of Architects are acquainted with their merits, and when they *Specify* the *Norris Pulley*, they know if it is used that the Building will have first-class Pulleys, as the word *Norris* across the face of each Pulley, is a *guarantee of unexcelled workmanship*. Beware of imitations, none genuine without the word *Norris* engraved on the face of each pulley.

ADDRESS

**NORRIS SASH PULLEYS,
BALTIMORE, MD.**

SAMSON SPOT SASH CORD.



SAMPLES ON
APPLICATION.



THIS is a cotton braided cord made from yarns of our own manufacture, guaranteed to be free from waste stock. The COLORED SPOT (our trade mark) is assurance that the cord is first quality in every way, and now that manufacturers make also one or more low grades, which easily deceive the consumer, the distinctive mark on the cord has become almost a necessity.

The Sash Cord Sizes are:—

- Size No. 6, diameter, 3-16 in. About 18 lbs. per dozen. About 66 ft. per lb. Suitable for weights of less than 10 lbs.
- Size No. 7, diameter, 7-32 in. About 22 lbs. per dozen. About 55 ft. per lb. Suitable for weights from 10 to 15 lbs.
- Size No. 8, diameter, 1-4 in. About 27 lbs. per dozen. About 44 ft. per lb. Suitable for weights from 15 to 25 lbs.
- Size No. 9, diameter, 9-32 in. About 33 lbs. per dozen. About 36 ft. per lb. Suitable for weights from 25 to 35 lbs.
- Size No. 10, diameter, 5-16 in. About 40 lbs. per dozen. About 30 ft. per lb. Suitable for weights from 35 to 45 lbs.
- Size No. 12, diameter, 3-8 in. About 58 lbs. per dozen. About 21 ft. per lb. Suitable for weights heavier than 45 lbs.

It is put up in hanks of 100 ft. each (two connected), one dozen hanks (1,200 ft.) in package, or in coils of any length desired.

**SAMSON CORDAGE WORKS,
No. 115 CONGRESS STREET,
BOSTON, MASS.**





SAMPLE FREE.

Window Stop Adjuster.

**IVES**PATENT SASH LOCKS,
MORTISE DOOR BOLTS,
WINDOW STOP ADJUSTERS, and
WINDOW HARDWARE SPECIALTIES*Our Goods are Leaders with Architects and the Trade.*

THIRTY-PAGE CATALOGUE MAILED FREE.



Ives Patent Door Bolts.



Ives Patent Sash Locks.

MANUFACTURED BY
HOBART B. IVES & COMPANY,
NEW HAVEN, CONN., U.S.A.

Inside View.



Blind Down, Slats Closed.

WHIPPLE'S PATENT AUTOMATIC BLIND HINGE.

FLUSH HINGE.



THIS Hinge is made of malleable iron and steel. It is easy to put on, strong and durable, and cannot blow off. It can be taken off at right angles by removing the pin. The independent anti-friction steel collar has an extra nut to tighten and make more tension on the spring when required. In use there is no wear to angles, no grating sound, or rattle, or slamming, and no interference when used on surface blinds. The Hinge invariably screws into the center of the jamb. No fixtures other than those for regular hinges are required for use on brick or wood buildings. The blinds will stay half open, an advantage that will be appreciated by those having bay-

windows, windows near piazza posts, etc. The Hinge is so made that the bracket can be taken off the Hinge and fastened to window frame of a brick house, where there is a staff bead, and then the Hinge is screwed into place. Four

Hinges make a complete set of blind trimmings. By removing the split pin they can be made right or left. The No. 1 Surface Hinge for brick buildings throws the blind out 4 inches, No. 2 throws the blind out $\frac{1}{2}$ inches, and the No. 3 throws the blind out $\frac{1}{2}$ inches from window frame when the blind is open. The No. 1 Flush Hinge for brick buildings throws the blind out $\frac{1}{2}$ inches, No. 2 throws blind out $\frac{1}{2}$ inches, and No. 3 throws blind out 6 inches from window frame when blind is open.



Circular and Price-List on Application.

R. P. WHIPPLE & CO., Greenfield, Mass.**Wilson's New Outside Venetian**

Blind pulls up and sides fold in compactly. Bronze Metal Tapes and Cords. Non-corroding. Everlasting.

Patenteed and Sole Manufacturer **JAS. GODFREY WILSON, S.E. Corner 23d St. and 6th Ave., New York.** Illustrated Booklet on Request.

Also ROLLING PARTITIONS for CHURCHES and SCHOOLS; BURGLAR and FIREPROOF ROLLING STEEL SHUTTERS for DWELLINGS, OFFICE BUILDINGS, and WAREHOUSES; VENETIAN BLINDS of EVERY DESCRIPTION; WIRE WINDOW SCREENS; HYGIENIC WARDROBES, Etc., Etc.



Wilson's Rolling Partitions.



Wilson's Piazza Blinds.



Blind Pulled Up.



Outside View.



Wire Window Screen.



Rolling Steel Shutters.

PARQUETRY FLOORS.

END-WOOD MOSAIC,
THIN PARQUETRY AND WOOD CARPET,
THICK PARQUETRY,
PLAIN STRIP FLOORS.

END-WOOD MOSAIC is made of small blocks of wood seven-eights inch thick, set on end, joined by a lead tongue. It is the most durable of parquetry floors, and its cost is relatively high.

WOOD CARPET is five-sixteenths inch thick, made of strips of wood (generally oak), glued to strong cloth, in pieces from 24x36 inches down according to pattern. It is laid by nailing through the surface with small steel brads.

THIN PARQUETRY, made like wood carpet, but in a large variety of woods and designs.

THICK PARQUETRY is seven-eighths inch thick, and is made in two ways, solid and veneered. The former is made of wood, the full thickness joined by tongue-and-groove. The latter is made of thin parquetry glued to a paneled backing. In both the separate sections are laid with tongue-and-groove joints. Plain fields are best solid, while complicated designs stand best when veneered.

We make a great variety of patterns, and are constantly adding new designs. We use only thoroughly seasoned kiln-dried lumber, and guarantee materials and workmanship. Designs and estimates furnished on application. Send for catalogue of designs.



WOOD MOSAIC CO.

ROCHESTER
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315 FIFTH AVE.,
NEW YORK.

Cabot's Insulating and Deadening Quilt.



ESCIENTIFIC non-conductor of heat and sound. Not a mere felt or paper, but a soft resilient cushion of dead air spaces, giving the most perfect conditions for heat insulation or the absorption of sound waves. Indestructible by moths, vermin, or decay, and uninflammable.

ASBESTOS-QUILT, the only sheathing made that is heat, sound, and fire-proof.

AGENTS AT ALL CENTRAL POINTS.

Samples and full particulars will be sent on application.

SAMUEL CABOT,

SOLE MANUFACTURER,

70 KILBY STREET, BOSTON, MASS.

The Ideal Blind Hinge



* Possesses every good feature of the best gravity locking blind hinge and has

TWO STRONG POINTS OF ADVANTAGE.

FIRST. When the blind is open, screens or storm sash slip into the opening without mutilating.

SECOND. The Ideal is provided with guide lugs to line it by when applying.

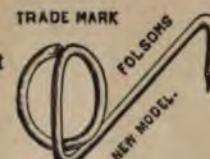
AGAIN. It is a strong, symmetrical pattern, with positive locking construction, avoiding all possibility of the blind rattling, or getting away from its position when open.

FULL PARTICULARS AND
FREE SAMPLE ON APPLICATION.

Stover Mfg. Co. • 167 RIVER STREET,
FREEPORT, ILL.

THE FOLSOM New Model Snow Guard.

It positively cannot injure any roof.



Made for shingle, slate, tile, or metal roofs.

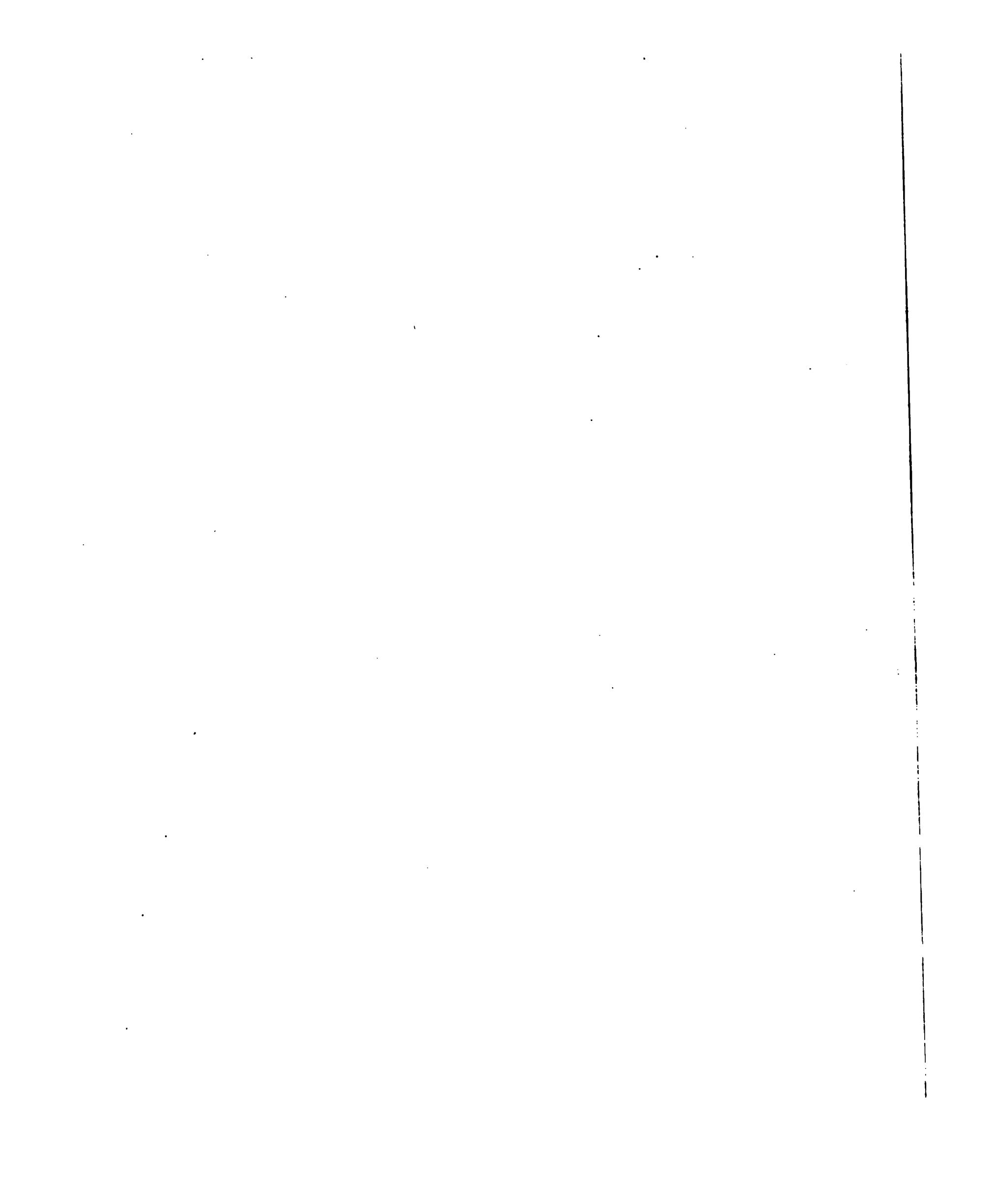
Style for slate or shingle roof.

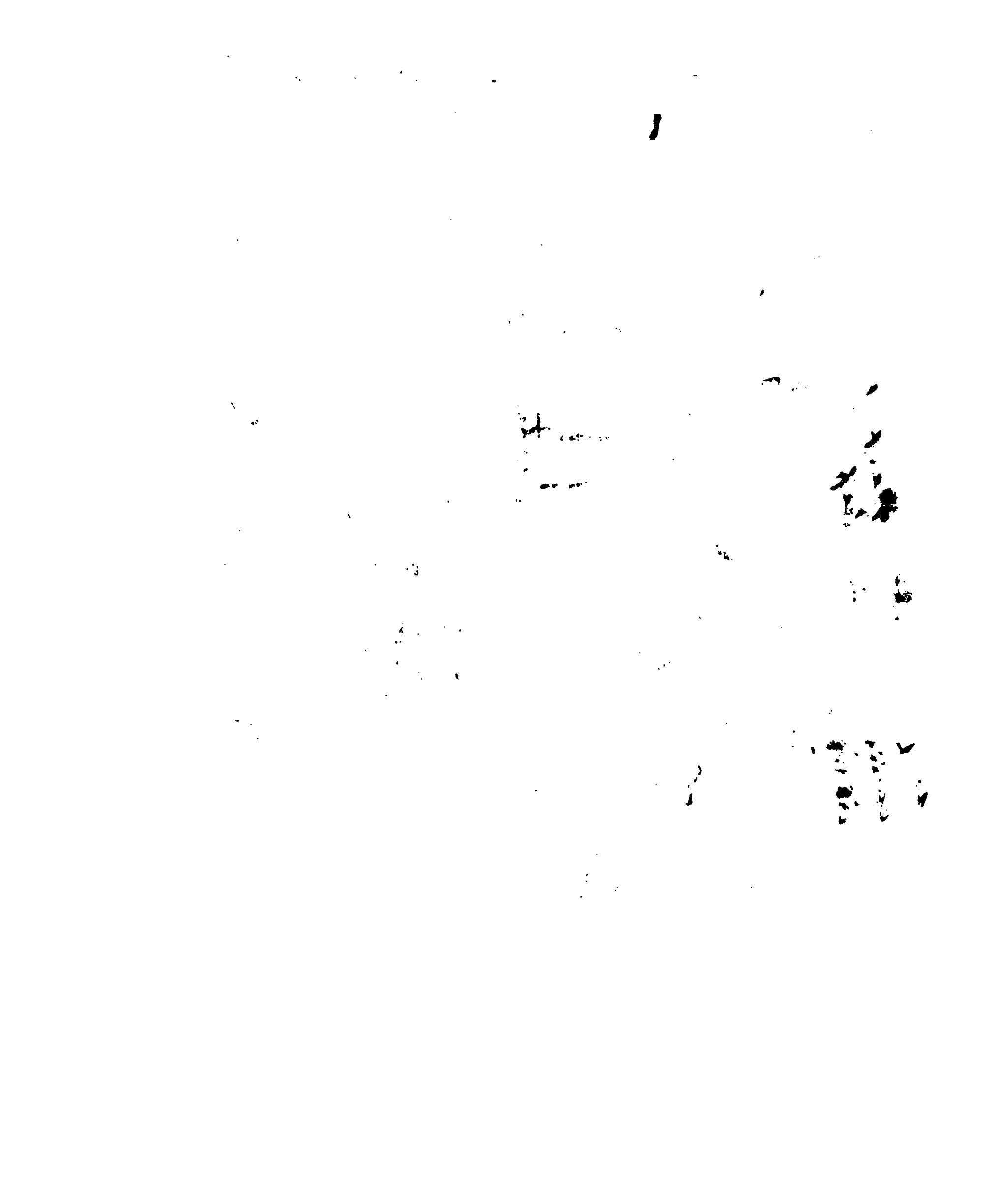
SPECIFIED BY LEADING ARCHITECTS THROUGHOUT THE COUNTRY. FULL PARTICULARS ON APPLICATION.

The Shull Overhead Pulley.

A N improvement in every way over the old style side sash pulley. Unequalled for mullion windows as illustrated on VII. and XI. of this book, for all weights can be hung in side pockets, dispensing with pockets in the mullions. Special patterns made for such windows. The Shull pulley has been put in many of the largest buildings. Over 800 dozen were used in the Park Row Syndicate Building, New York.

THE FOLSOM SNOW GUARD CO.,
116 SOUTH ST., BOSTON, MASS.





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